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A MONOGRAPH
OF THE
GENUS TERACOLUS

BY
EMILY MARY BOWDLER SHARPE

(Parts I.-XI., 1898-1902 all published)



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INDEX TO A MONOGRAPH OF THE GENUS TERACOLUS

Synonyms in *Italics*. Figures in brackets refer to the Plates.

| | PAGE |
|-----------------------------------|----------|
| <i>abyssinicus</i> | 24 |
| <i>agoye</i> | 24 |
| <i>amatus</i> (1) | 5 |
| <i>amatus</i> | 1 |
| <i>anax</i> | 47 |
| <i>antigone</i> (40) | 140 |
| <i>antigone</i> | 137, 149 |
| <i>arne</i> | 12 |
| <i>aurora</i> | 97 |
| <i>auxo</i> (27) | 81 |
| <i>auxo</i> | 88 |
| <i>bacchus</i> (24) | 71 |
| <i>bettoni</i> (19) | 56 |
| <i>bifasciatus</i> | 153 |
| <i>bimbura</i> | 105 |
| <i>bohemanni</i> | 32 |
| <i>buxtoni</i> (22) | 64 |
| <i>cænis</i> | 98 |
| <i>calais</i> (1) | 1 |
| <i>calais</i> | 8 |
| <i>carnifer</i> | 1 |
| <i>casimirus</i> | 105 |
| <i>castalis</i> (7) | 19 |
| <i>chromiferus</i> (13) | 37 |
| <i>einetus</i> | 119 |
| <i>citreus</i> | 90 |
| <i>coliagenes</i> | 61 |
| <i>comptus</i> | 153 |
| <i>coniger</i> | 140 |
| <i>crowleyi</i> (1a) | 8 |
| <i>cyprea</i> | 5 |
| <i>daira</i> (37) | 125 |
| <i>daira</i> | 153 |
| <i>dalila</i> | 125 |
| <i>delphine</i> | 140 |
| <i>demagore</i> | 125 |
| <i>difficilis</i> (20) | 58 |
| <i>dissociatus</i> (28) | 88 |
| <i>dubius</i> | 18 |
| <i>dynamene</i> | 1, 8 |
| <i>eione</i> (41) | 149 |
| <i>elgonensis</i> (12) | 35 |
| <i>eliza</i> | 47 |
| <i>emini</i> (39) | 137 |
| <i>ena</i> | 102 |
| <i>ephyia</i> (35) | 114 |
| <i>eris</i> (9) | 24 |

| | PAGE |
|----------------------------------|--------------------|
| <i>eris</i> | 30 |
| <i>erone</i> | 67 |
| <i>etrida</i> (33) | 104 |
| <i>etrida</i> | 105 |
| <i>eucharis</i> (31) | 97 |
| <i>eucharis</i> | 81 |
| <i>eunoma</i> | 37 |
| <i>eunomus</i> (13) | 36 |
| <i>evagore</i> (39) | 134 |
| <i>evagore</i> | 137, 140, 149, 153 |
| <i>evanthe</i> (32) | 102 |
| <i>evanthides</i> (34) | 112 |
| <i>evarne</i> (29) | 90 |
| <i>evarne</i> | 81, 95 |
| <i>farrinus</i> | 105 |
| <i>fatma</i> | 24 |
| <i>flaminia</i> | 140 |
| <i>flavida</i> | 74 |
| <i>foliaceus</i> | 42 |
| <i>friga</i> | 140 |
| <i>galathinus</i> | 149 |
| <i>halyattes</i> | 115 |
| <i>hetæra</i> (15) | 42 |
| <i>hetæra</i> | 38, 45 |
| <i>heuglini</i> (38) | 130 |
| <i>idueissa</i> | 32 |
| <i>imperator</i> (18) | 52 |
| <i>incretus</i> (26) | 77 |
| <i>infumatus</i> (36) | 123 |
| <i>intermissus</i> | 18 |
| <i>ione</i> (23) | 67 |
| <i>ione</i> | 47, 58, 61, 64 |
| <i>jacksoni</i> | 131 |
| <i>jalone</i> | 58, 61, 64 |
| <i>jamesi</i> | 131 |
| <i>jobina</i> | 67 |
| <i>johnstoni</i> (8) | 21 |
| <i>keiskamma</i> | 81 |
| <i>kenmedii</i> | 5 |
| <i>lais</i> (35) | 115 |
| <i>liagore</i> | 90, 126 |
| <i>limbatus</i> (34) | 110 |
| <i>lorti</i> (16) | 45 |
| <i>ludovicie</i> | 45 |
| <i>lycæus</i> | 140 |
| <i>lycoris</i> | 115, 140 |
| <i>maimuna</i> (11) | 30 |

| | PAGE |
|------------------------------------|----------------|
| <i>mananhari</i> (25) | 74 |
| <i>metagone</i> | 153 |
| <i>minans</i> | 140 |
| <i>modestus</i> | 5 |
| <i>mrogoana</i> | 71 |
| <i>nothus</i> | 74 |
| <i>nouna</i> | 125 |
| <i>ocellatus</i> (2) | 11 |
| <i>ochreipennis</i> | 16 |
| <i>odysseus</i> | 126 |
| <i>opalescens</i> (10) | 27 |
| <i>opalinus</i> | 27 |
| <i>pallene</i> (36) | 119 |
| <i>pallens</i> | 98 |
| <i>pelus</i> | 18 |
| <i>pernotatus</i> | 105 |
| <i>philamene</i> | 12 |
| <i>phillipsii</i> (30) | 95 |
| <i>phisadia</i> (3) | 12 |
| <i>phlegetonia</i> | 140 |
| <i>phlegyas</i> (21) | 61 |
| <i>phleggyas</i> | 56, 58, 64, 71 |
| <i>protractus</i> (2) | 9 |
| <i>pseudetrida</i> | 119 |
| <i>pseudevanthe</i> | 98 |
| <i>puellaris</i> (5) | 16 |
| <i>puniceus</i> (14) | 38 |
| <i>purus</i> | 105 |
| <i>regina</i> (17) | 47 |
| <i>rorus</i> | 16 |
| <i>rothschildi</i> (4) | 14 |
| <i>saxeus</i> | 134 |
| <i>speciosa</i> | 67 |
| <i>stygia</i> | 125 |
| <i>subfasciatus</i> (12) | 32 |
| <i>subfumosus</i> | 140 |
| <i>swinhoei</i> | 134 |
| <i>syrtinus</i> | 90 |
| <i>thruppi</i> | 131 |
| <i>titea</i> | 98 |
| <i>topha</i> | 81 |
| <i>vestalis</i> (6) | 18 |
| <i>vulnerata</i> | 77 |
| <i>xanthevarne</i> | 90 |
| <i>xanthus</i> (42, 43) | 153 |
| <i>xanthus</i> | 126 |
| <i>yerburyi</i> | 134 |



MONOGRAPH

OF THE

GENUS TERACOLUS.

TERACOLUS CALAIS (Cramer)

(Plate 1, figs. 1, 1a-1f).

Papilio calais, Cramer, Pap. Exot. i. pl. liii. figs. C. D. (1779).

Pontia dynamene, Klug, Symb. Phys. pl. vi. figs. 17, 18 (1829).

Idmuais calais, Boisd. Sp. Gén. i. p. 587, No. 4 (1836); Trimen, Rhop. Afr. Austr. p. 61, No. 40 (1862).

Idmais dynamene, Boisd. Sp. Gén. i. p. 588, No. 5 (1836); Kirby, Syn. Cat. Lepid. p. 499 (1871).

Teracolus dynamene, Butler, P. Z. S. 1876, p. 138.

Teracolus calais, Butler, P. Z. S. 1876, p. 139; Guy Marshall, P. Z. S. 1879, p. 9.

Teracolus carnifer, Butler, t.c. p. 138, p. vii. figs. 8, 9.

Teracolus calais, var. *dynamene*, Butler, P. Z. S. 1896, p. 245.

Teracolus amatus, pt. Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 388 (1897).

MALE.—General colour salmon-buff or light orange, with black markings; the greater part of the primaries salmon-buff, their extreme base and costal margin ashy blackish, suffused with buff, extending as far as the end of the discoidal cell, where there is a very conspicuous black spot. A second similar spot, but rather smaller, is situated between the sub-median nervure and the first median nervule, towards the anal angle.

The apical portion of the primaries is blackish for about one-third of the wing, narrowing towards the inner margin; this apical area is mottled with two rows of salmon-buff spots, the first row consisting of four ovate spots, the sub-costal spot being smaller than the rest; these are succeeded by a sub-terminal row of minute longitudinal spots near the end of each nervule. The secondaries are of the same colour as the primaries, and are bordered with black, which is very distinct along the costa and broadens out round the hind margin: this black border is broken by a sub-terminal row of five salmon-buff spots between the nervules, the inner aspect of the black border having the appearance of being broken up into a narrow line of small black dots. The basal area of the secondaries is ashy blackish, suffused with salmon-buff, and is accompanied by a whitish inner margin. In perfect specimens both wings have a narrow fringe of salmon-buff. Expanse 1·6 inch.

Underside.—Of a sulphur-yellow colour inclining to light green, with an orange

shade on the basal portion of the primaries and on the central area of the secondaries, the latter having a tiny black spot at the end of the cell. The primaries show several distinct black spots, a large one between the sub-median nervure and the first median nervule; a second smaller spot occurs nearer the hind margin, between the first and second median nervules; above this spot is a band of dusky green shading, extending to the costal margin and corresponding with the inner black band on the upper surface. The end of the discoidal cell is outlined with black.

FEMALE.—While reproducing the markings of the male, the female differs from that sex considerably in the extent of the mottlings and in general colour. Thus the orange is confined to the basal area, and the ground colour of the apical portion of the wing is lemon-yellow; hence the spots which intersect the dark apical portion of the wings are lemon-yellow instead of being salmon-buff as in the male, though, in the secondaries, there is a slight tint of orange perceptible on the inner band. The blackish aspect of the wings is not so pronounced in the female, but is of a browner shade, and the blackish border of the secondaries is narrower; while the sub-terminal row of pale spots is distinctly larger and more prominent than in the other sex.

Underside.—Much more coarsely marked, and with the orange confined to a patch on the basal third of the wings. The markings which are faintly evident on the underside of the male are strongly emphasised in the female, being darker and of a reddish-brown colour. This is especially the case on the secondaries, where the dusky markings are distinctly indicated, so that there is a narrow but distinct sub-terminal line of reddish-brown traversing the wing. Expanse 1.6 inch.

Among the females there is an occasional tendency to a white form, wherein the pale markings of the wings are almost yellowish-white. Great variation in size is evident in a series, and I have examined some unusually large specimens from Mombasa and Kilimanjaro (see plate 1a, figs. 2 and 2a).

HABITAT.—Africa, extending to Persia, and North-West India.

SOUTH-WEST AFRICA.—Lower Congo (*Salvin-Godman Coll.*; *Mus. Brit.*); Kinsembo (*H. T. Ansell*; *Mus. Brit.*); Loanda (*Salvin-Godman Coll.*; *Mus. Brit.*); Ambriz (*J. J. Monteiro*; *Mus. Brit.*).

EAST AFRICA.—Kilimanjaro (*F. J. Jackson*; Butler, P. Z. S. 1888, p. 92); Usukuma, June, July (*E. J. Baxter*; *Mus. E. M. S.*); Usagara, July, August (*E. J. Baxter*; *Mus. E. M. S.*); Ugogo, July (*E. J. Baxter*; *Mus. E. M. S.*); Dar-es-Salaam (*Mus. W. Rothschild*); Zanzibar (*Mus. H. Grose Smith*); Voi River, Teita District; Mreru-Tsavo, January (*Capt. Pringle*; E. M. Sharpe, P. Z. S. 1894, p. 349); between Gulu-Gulu and Kibwezi, November, December (*F. J. J.*; *Mus. F. J. Jackson*); Sabaki River (Hampson, Ann. and Mag. Nat. Hist.

(6) vii. p. 181); Mombasa (*Mus. H. Grose Smith*); Lamu (*Slingsby Godfrey*; *Mus. E. M. S.*); Melindi (*Mus. W. Rothschild*); Witu (*F. J. J.*; *Mus. F. J. Jackson*); Ngatana, January; Lake Losagata (*Dr. J. W. Gregory*; Butler, P. Z. S. 1894, p. 571).

NORTH-EAST AFRICA.—Bihen-Andola, Goolis Mountains, Somali Land, February (*Coll. Mrs. L. Lort-Phillips*; E. M. Sharpe, P. Z. S. 1896, p. 527); Dobar, Goolis Mountains (*Coll. Mrs. L. Lort-Phillips*). West Somali Land; Ahdeh, July; Stonybrook, Erer River, August; Sheik Husein, September (*A. Donaldson Smith*; E. M. Sharpe, P. Z. S. 1896, p. 535). ABYSSINIA (*Mus. Salvin-Godman*). BOGOS LAND, Kokai and Gelamct, Lebka Valley (*W. Jesse*; *Mus. Salvin-Godman*).

ARABIA.—Yemen (*Mus. Salvin-Godman*); Aden (*Colonel Yerbury*; Butler, P. Z. S. 1884, p. 487); Lahej (*Mus. C. Swinhoe*).

SYRIA.—(*Mus. Salvin-Godman*).

PERSIA.—Fao, Persian Gulf (*W. D. Cumming*; *Mus. Brit.*).

SIND.—Karachi, very common in May, November, and December (*C. Swinhoe*; Butler, P. Z. S. 1884, p. 488).

KATHIAWAR.—(*Mus. F. Moore*; Butler, P. Z. S. 1876, p. 138). PUNJAB.—Deesa (*Mus. C. Swinhoe*).

NORTH-WEST PROVINCES.—Agra (*Mus. F. Moore*; Butler, P. Z. S. 1876, p. 138); Mynpuri (*Mus. F. Moore*; Butler, P. Z. S. 1876, p. 138).

Papilio calais of Cramer was described from the Cape of Good Hope, but no species of this group of *Teracolus* is known from the Cape Colony, and Cramer's habitat for the species is therefore no doubt erroneous. Dr. Butler identifies Angolan specimens in the British Museum as typical *T. calais* (Cramer), and I have figured specimens from this locality, though the illustrations given by Cramer have doubtless faded in colour, and are now somewhat difficult to identify. Other specimens from Aden also match fairly well with Cramer's figures. I agree with Dr. Butler and Mr. Guy Marshall that *T. dynamene* (Klug) is inseparable as a species from *T. calais*.

T. calais differs from the Indian *T. amatus* in having the second black spot on the primaries, the one just above the sub-median nervure, much larger and in no case evanescent, as it is in the Indian and Ceylonese examples. I have never seen a white female of true *T. calais* from Africa, but the female, as will be noticed from the figure (Plate 1, fig. 16) has always a considerable amount of orange towards the base of both primaries and secondaries. Again, *T. calais* always has more distinct salmon-coloured spots near the apex of the primaries, forming a second row of these spots towards the tips of the wings. In *T. amatus* and its darker form, *T. modestus*,

the apex of the primaries is almost black, and the indication of the second row of spots is so faint that the latter are in most cases obsolete, and hence the species has a much heavier black border to both primaries and secondaries. The black spot above the sub-median nervure is much smaller as a rule, but not invariably, than that shown by *T. calais*.

Teracolus carnifer (Plate 1, figs. 1f) was described by Dr. Butler from a specimen from Mynpuri in Mr. F. Moore's collection (P. Z. S. 1876, p. 138), and he afterwards received the same form from Aden from Colonel Yerbury (P. Z. S. 1884, p. 488); while he mentions that it has also been sent from Karachi by Colonel Swinhoe.

In his latest paper (Ann. and Mag. Nat. Hist. (6) xx. p. 388) he considers his *T. carnifer* to be the "dry-season form" of his *T. amatus*, with which he also unites *T. calais*.

Mr. Guy Marshall also writes: "*T. carnifer* is clearly a dry-season form of this species, the bright green of the underside being modified into a sandy pinkish."

I have only seen three specimens referable to *T. carnifer*; they differ from typical *T. calais* in their very pale coloration, the spots and markings on the primaries being very pale brown, and the dusky brown bands on the secondaries nearly obsolete, especially in the case of the inner line, which is only faintly indicated. The rows of pale sub-terminal spots are thus rendered much more conspicuous by the restriction of the blackish hind-margins of both wings, over which is suffused a general shade of reddish orange, especially distinct towards the oasal portion on the secondaries; there is a paler yellowish patch in the discal area of the wing.

Colonel Yerbury has very kindly given me the subjoined notes on the habits of this species: "At Aden *T. calais* is very abundant, and may be found anywhere, but it affects for choice bushes of *Salvadora persica*, on which plant Captain Nurse found the eggs and larvæ.

"The eggs are laid in batches on the leaves, and the newly hatched larvæ are at first gregarious. They vary somewhat in colour, some being pea-green, darker on the back, lighter on the flanks, and with a faint dorsal line; others again are darker, with a nearly white dorsal line. When full-fed, they are about an inch long, some having black heads and some green heads, but both forms may be reared from the same batch of eggs. The pupæ, too, vary somewhat, some being pale green speckled with black. There is but little doubt that at Aden *T. calais* represents the wet district form and *T. dynamene* the dry, *T. carnifer* being only a casual variety. Heavy rain fell in May and June 1883, and early in July an unusually bright-coloured form of this butterfly was on the wing among the *Salvadora* bushes in the Gold Mohur Valley. This form was never again met with."

Captain Nurse also gives a description of the larvæ and pupæ in the "Proceedings" for 1896, p. 245.

EXPLANATION OF THE FIGURES OF *T. calais*.

- Plate 1, fig. 1. ♂. Ambriz, Angola (*J. J. Monteiro*; *Mus. Salvin-Godman*).
 „ 1a. Underside.
 „ 1b. ♀. Loanda (*J. J. Monteiro*; *Mus. Salvin-Godman*).
 „ 1c. Underside.
 „ 1d, 1e. Larva and Pupa, Aden (*Capt. Nurse*; *Mus. Brit.*).
 „ 1f. *T. carnifer*, Butler, ♀, Aden (*Colonel Yerbury*; *Mus. Brit.*).
 Plate 1a, „ 2. Kibwezi, December 1888 (*Coll. F. J. Jackson*).
 „ 2a. Underside.

TERACOLUS AMATUS (Fabr.)

(Plate 1, figs. 2, 2a, 2b).

Papilio amatus, Fabricius, Syst. Ent. p. 476 (1775).

Papilio cypræa, Fabricius, Mant. Ins. ii. p. 21 (1787).

Pieris amata, Godart, Enc. Méth. ix. p. 131, No. 39 (1819).

Idmais amata, Butler, Cat. Fabr., p. 117, No. 1 (1869); Kirby, Syn. Cat. Lepid., p. 499 (1871).

Teracolus modestus, Butler, P. Z. S. 1876, p. 137.

Teracolus amata, Butler, P. Z. S. 1876, p. 138.

Teracolus cypræa, Butler, *t.c.*, p. 138.

Teracolus kennedii, Swinhoe, P. Z. S. 1884, p. 440.

Teracolus amatus, Guy Marshall, P. Z. S. 1897, p. 9; Butler, Ann. and Mag. Nat. Hist. xx. (6) p. 388, 1897.

MALE.—Differs from *T. calais* in having the black spots at the end of the discoidal cell and above the sub-median nervure much smaller; the hind margin and apical portion of the primaries is more of a brownish black tint. The greater portion of the primaries is salmon-buff, with a row of four spots of the same colour from the costa to the third median nervule, which relieves the apical patch, between the second and first median nervules. These spots are much smaller in some specimens than in others, whilst they are occasionally obsolete. The costa and the base are grey, suffused with salmon-buff. Secondaries similar to those of *T. calais*.

Underside.—Resembles that of *T. calais*, with the exception that the black markings on the primaries are much reduced in size. Expanse 1·5 inch.

FEMALE.—Yellow like the male, but differing from the same sex of *T. calais* in having the two black spots on the primaries smaller than in that species. A white form of the female frequently occurs, which is *T. cypræa*, Fabricius, as pointed out by

Dr. Butler. In the darker form, *T. modestus*, Butler, a white female is the rule, and those with a yellow tinge less frequently occur. Expanse 1.4 inch.

HABITAT.—Indian Peninsula and Ceylon. Orissa (*Mus. Brit.*); Kathiawar to Guzerat, Kandesh, Nassic, Sholapur, Bijapur and Kanara (*J. Davidson*); Bombay (*Mus. Rothschild*; *Mus. Salvin-Godman*; *Mus. Brit.*); Elephanta Island (*Mus. Brit.*); Deccan (*Mus. Brit.*); Ahmednuggar (*Mus. Brit.*); Kippenhally, Nittur, Arsikare, Berhampur, Tarikare Kolar and Bangalore (*Captain E. Y. Watson*; *Mus. Brit.*); Madras (*Captain E. Y. Watson* *Mus. Brit.*); Coromandel (*Mus. Brit.*); Nilghiris (*Coll. Bates*, *Mus. Salvin-Godman*; *Mus. Brit.*); Ceylon (*Mus. Rothschild*; *Mus. Brit.*).

Dr. Butler in his revision of the genus *Teracolus* (Ann. and Mag. Nat. Hist. (6) xx. p. 388, 1897) unites *T. calais* to *T. amatus*, and recognises only one species. I am inclined, however, to separate *T. amatus* as distinct from *T. calais*, not only on account of certain slight but constant differences of colour, but also from the fact that the two forms inhabit apparently well-defined geographical areas. *T. calais* is confined to the Ethiopian region and the Mediterraneo-Persic sub-region, while *T. amatus*, and its darker form *T. modestus*, represent *T. calais* in the Indian Peninsular sub-region and in Ceylon.

T. kennedii and *T. cypræa* are also identical with *T. amatus*, the latter being the white form of the female. In support of this opinion I may quote the following remarks by Mr. Guy Marshall: "*T. amatus* is nothing more than a local race of *T. calais*, but as the distinctions appear fairly constant and the two forms do not merge too much into one another, I prefer to keep them apart. *T. amatus* therefore represents *T. calais* in Central and Southern India and Ceylon. *T. kennedii* is identical with *T. amatus*, and I cannot accord specific rank to *T. modestus*, which is only a rather more heavily marked variety of the same species, their identity being well shown in the British Museum series, which represents a gradual and unbroken gradation from one to the other. Captain Watson, following Mr. Butler's identification of the insect, considers *T. cypræa* to be a synonym of *T. calais*. Fabricius's descriptions are delightfully vague, but I prefer to follow Boisduval in believing that in *T. cypræa* he was describing the female of his *T. amata*." The late Captain Watson (Journ. Bomb. Nat. Hist. Soc. vol. viii. p. 520) very truly observes: "These two species are themselves not much better than geographical races, *T. amatus* being confined to Southern India, where it occurs commonly and is replaced by *T. calais* in the drier climate of Western and North-Western India. *T. kennedii*, Swinhoe, does not appear to differ from *T. amatus*, or *T. carnifer* from *T. calais*. The females of *T. calais*, *T. amatus* and *T. dynamene* are very similar to the males. The females of *T. modestus* are either white or salmon-colour." A specimen of *T. modestus* from Ganjam in Mysore (Pl. 1, fig. 2b) seems to me to be inseparable from Ceylonese examples, and I have therefore

followed Dr. Butler in uniting these two forms. He also remarks: "Intermediate specimens exist which, to my mind, render it impossible to keep these two species apart. Roughly speaking, *T. amatus* may be said to range throughout the plains of Central and Southern India, occurring as *T. modestus* in Ceylon. *T. cypræa* is the white form of the female."

Mr. Davidson has very kindly sent me the following note: "*T. amatus* is a very local butterfly, but excessively common when met with. Its larva feeds on *Salvadora persica*, a plant requiring a salt soil, and whenever that plant is found, the butterfly is there also. When I first took it, I did not know its food plant, and so did not appreciate the cause of its isolated distribution. I have spent about twenty years in India, changing camp every two or three days for at least seven months yearly. During that time I have travelled pretty well over the Tumkur district in Mysore, the districts of Kandesh, Nassic, Sholapur, Bijapur and Kanara in the Bombay Presidency, and also spent some months in Northern and Eastern Guzerat and in Bombay itself. I never noticed this insect in Tumkur, Satara, or the Panch Mahals. In Sholapur I found it in only two villages, about fifteen miles apart. In Kandesh I found it in a few acres in one village; in Nassic, in the small compound of a river bungalow, and in Kanara beside one tree on the coast, fifteen miles south of Karwar. It was, however, plentiful enough among the ruins round Bijapur, in the salt-pans near Bombay, and all along the frontier between Kathiawar and Guzerat. Now in the case of a butterfly so local, it seems to me that it is impossible that more than one closely allied species could be found in any one of these places, and if we find specimens that could be brought under two forms in one place, they must be considered as one species. I find all my specimens from Kandesh, Nassic and North Guzerat have a square sub-median spot on the forewing; all those from Bijapur and Sholapur have a more or less linear one, one specimen from Sholapur, however, approaching very near the Kandesh ones. I have only two Kanara specimens—a male with a large square mark, and a female (I think of the same brood), white, with a linear one. Similarly in Bombay I have specimens with both linear and square spots (I think from one brood). I can, however, find no orange suffusion on the undersides of any specimens from Sholapur, Bijapur, or Kanara, while in the Bombay and Nassic specimens, some have this tint and some have not, while all my Guzerat and Kandesh specimens show it more or less.

"The larva and pupa I described in a paper in the Journal Bombay Nat. Hist. vol. x. p. 572, n. 148 (1897) as follows: "Larva very like that of *Terias*, cylindrical or slightly depressed, with a rough surface due to minute tubercles, from each of which grows a very small bristle. The colour is a uniform grass-green with a blue dorsal line more or less distinct, and a yellowish lateral line, dividing the colour of

the back from the paler green of the under parts. The pupa is compressed and has the wing-cases produced into a keel like that of *Terias*. It is suspended in the same manner by the tail, and a moderately long band. The colour is some shade of dingy brown or dirty green. The butterfly lays a number of eggs on the same plant, so a great number of small larva are generally to be got from one small branch."

EXPLANATION OF THE FIGURES OF *T. amatus*.

- Plate 1, fig. 2, ♂. Kollar, Mysore, Oct. 1888 (*Capt. Watson; Mus. Brit.*).
 „ 2a, ♀. (*T. cypræa*, Fabr.); Mysore, Nov. 1888 (*Capt. Watson; Mus. Brit.*).
 „ 2b, ♂. (*T. modestus*, Butler); Berhampur, Ganjam, July 27, 1887 (*Capt. Watson; Mus. Brit.*).

TERACOLUS CROWLEYI, sp. n.

(Plate 1a, figs. 1, 1a, 1d).

Idmais dynamene (nec. Klug), Mabilie, in Grandid. Hist. Nat. Madag. Lepid. i. p. 285, pl. xli., figs. 8, 9, 9a (1887).

Teracolus calais, pt. Guy Marshall, P. Z. S. 1897, p. 9; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 389 (1897).

MALE.—Similar to *T. calais*, and intermediate between that species and *T. amatus*. Brighter than *T. calais* in tint, with the black spot above the sub-median nervure very boldly indicated, but the small row of spots near the apex of the primaries nearly obsolete, as in *T. amatus*. Expanse 1·6 inch.

FEMALE.—White or lemon-yellow, resembling the female of *T. amatus*, but easily distinguished by the faintly indicated row of dusky spots on the secondaries, which are separated from the black border of the hind margin by a broad intervening band of white. Expanse 1·7 inch.

HABITAT.—MADAGASCAR (*types in Mus. P. Crowley*); South Madagascar (*Last; Mus. H. Grose Smith*); East and West Coasts (Mabilie, *l.c.*); Mouroundava, South-West Madagascar (*Mus. Rothschild*).

SOUTH-EAST AFRICA.—Zambesi (*Mus. Brit.*). Pungwe River (*Mus. Cecil Barker*). Beira (Guy Marshall, P. Z. S. 1897, p. 9). Delagoa Bay (Guy Marshall, *l.c.*).

A male and two females of this species (one being of the yellow form) are in Mr. Philip Crowley's collection, and I have seen five specimens representing both sexes from Mouroundava in the collection of the Hon. Walter Rothschild. Several examples, comprising both the white and yellow forms of the female, are in Mr. H. Grose Smith's collection, obtained by Mr. Last. Three specimens, two males and a white female, are in Mr. Cecil Barker's collection from the Pungwe River, and I also refer to this species an example in the British Museum, said to have been procured on the Zambesi,

but without any record of the actual collector. Mr. Guy Marshall mentions his having taken a white female at Beira in January 1896, and also specimens at Delagoa Bay.

The present species is, as might be expected, a near ally of *T. calais*, and Dr. Mabille has figured it under the name of *T. dynamene*, which, as I have already shown, is not separable from *T. calais*.

T. crowleyi differs, however, from *T. calais* in the characters noted above, and is further remarkable for having a white female, as in the nearly allied Indian species, *T. amatus*.

EXPLANATION OF THE FIGURES OF *T. crowleyi*.

- Plate 1a, fig. 1. ♂. Madagascar (*Mus. P. Crowley*).
 „ 1a. ♀. Madagascar (*Mus. P. Crowley*).
 „ 1b. Underside.
 „ 1c. ♀. Madagascar. Yellow form (*Mus. P. Crowley*).
 „ 1d. Underside.

TERACOLUS PROTRACTUS, Butler.

(Plate 2, figs. 1, 1a-1c.)

Teracolus protractus, Butler, P. Z. S. 1876, p. 137; Swinhoe, P. Z. S. 1884, p. 508; Butler, P. Z. S. 1886, p. 372; Guy Marshall, P. Z. S. 1897, p. 10; Butler, Ann. and Mag. Nat. Hist. (6), xx. p. 388 (1897).

MALE.—General colour bright salmon-pink with broad black borders and greyish-blue markings; the greater part of the primaries salmon-pink, the costa and the hind margin black, the apical portion relieved by six longitudinal spots or streaks of a greyish-blue, varying in size; the basal area of the wing also greyish-blue, the costa being dusted with this same colour. At the end of the discoidal cell is a black spot, uniting with the black of the costal margin.

The secondaries reproduce the same colour as in the primaries, but the salmon-pink central area is much reduced in extent between the bluish-grey base and the broad black border of the hind margin, which occupies nearly half of the wing. The fringe on both wings is white.

Underside.—Greenish-yellow with the centre of the primaries somewhat suffused with orange, of which there is also a slight shade in the middle of the secondaries. At the end of the cell is a minute black spot, corresponding with the black spot on the upper surface. A row of black spots varying in size occurs between the middle of the wing and the hind margin, marking the junction of the orange centre and the

greenish hind border; these spots are situated between the third discoidal nervule and the sub-median nervure. Expanse 1·6–1·75 inch.

FEMALE.—Very similar to the male, the broad marginal borders being browner in tint.

The underside does not differ from that of the male, with the exception that the black spots on the primaries are larger. Expanse 1·9 inch.

The “dry-season” form is much lighter in colour, and looks very different from the “wet-season” form, being not nearly so handsomely marked; the marginal borders are brown instead of black, and the spots on the primaries are paler, inclining to buff instead of bluish-grey. At the base of the wings there is also a slight dusting of grey extending along the costal margin, almost to the sub-terminal row of dark spots near the apex; the light oblong row of markings near the apex is brought into relief by the pale brown of the hind margin on one side, and by a row of black spots on the inside.

The secondaries are plainly coloured, having the basal area pink, with a broad hind-marginal border of brown.

The under-surface is suffused with pale pinkish buff, becoming more yellow towards the base of the primaries; the black spots mentioned in the description of the “wet-season” form are also smaller and browner in colour. Expanse 1·6 inch.

HABITAT.—North-West India.

PUNJAB.—(*Gen. Hearsay*; types in *Mus. Brit.*); Campbellpur and Chitta Pahar (*Col. Yerbury*; *Butler*, P. Z. S. 1886, p. 355); Hyderabad, Sind (*Mus. Rothschild*; *Mus. P. Crowley*); Karachi (*Col. C. Swinhoe*, P. Z. S. 1884, p. 508); Hubb River near Karachi (*Col. C. Swinhoe, in epist.*); Kutel (*Mus. Brit.*; *Mus. II. Grose Smith*); Frontier of Guzerat and Kathiawar (*J. Davidson, in epist.*); Deesa (*Mus. Rothschild*; *Col. C. Swinhoe, in epist.*).

This handsome species is one of four belonging to an entirely different section to those already described. They are all distinguished by the heavily marked black border on both wings.

T. protractus is the only species of this group that has the salmon-pink extended over the secondaries as well as the primaries. As will be seen by the above descriptions, the “dry-” and “wet-” season forms are strikingly different, and it is curious, as Mr. Guy Marshall remarks, that they have not yet been described as distinct species. The late Captain Watson observes: “There are two well marked seasonal forms which differ in the tone of the underside, which in the dry-season form, obtained in November, is pale reddish-yellow, and in the wet-season form, obtained in June, July, and August, is bright yellow.”

The range of *T. protractus* is somewhat limited and is confined to North-Western

India. The original specimens, which belong to the dry-season form, were described by Dr. Butler from specimens procured in the Punjab by General Hearsay. Colonel Yerbury gives the following note: "A single specimen, Campbellpur, June 29, 1885; found commonly in the Chitta Pahar near Lumbahdun, Kala Dilli, etc., at the end of November and beginning of December." (*Cf.* Butler, P. Z. S. 1886, p. 372.) Colonel Swinhoe tells me that he has specimens from Campbellpur, collected in April, June, July, November, and December. He has himself procured the species at Hyderabad in Sind, in July, and on the Hubb River about twenty miles from Karachi in South Sind, in August, September, October, and November. Specimens from Kutch are in the British Museum and in the collection of Mr. H. Grose Smith. Mr. Davidson writes to me: "I have only taken *T. protractus* on the Guzerat and Kathiawar Frontier. It was nowhere common and very local." Colonel Swinhoe also informs me that he has specimens from Deesa, taken in the months of July, August, and September. No notes upon the habits of this species appear to have been published.

EXPLANATION OF THE FIGURES OF *T. protractus*.

- Plate 2, fig. 1. ♂. Hubb River, August 1879 (*Col. C. Swinhoe; Mus. Brit.*).
 „ 1a. Underside.
 „ 1b. ♀. Cambellpur, June 29, 1886 (*Col. Yerbury; Mus. Brit.*).
 „ 1c. ♂. (Dry-season form) Underside. Chitta Pahar, 2000 feet, November 28, 1885 (*Col. Yerbury; Mus. Brit.*).

TERACOLUS OCELLATUS, Butler.

(Plate 2, figs. 2, 2a.)

Teracolus ocellatus, Butler, P. Z. S. 1885, p. 767; E. M. Sharpe, P. Z. S. 1896, p. 535; Guy Marshall, P. Z. S. 1897, p. 10; Butler, Ann. and Mag. Nat. Hist. (6), xx. p. 389 (1897).

MALE.—Intermediate between *T. protractus* and *T. phisadia*. As pointed out by Dr. Butler, the margin of the grey base of the wings is restricted and bounded by a straight margin. The secondaries are for the most part lemon-yellow, but are pervaded with a distinct shade of salmon-pink spreading from the costal margin obliquely towards the black border of the hind margin.

The discoidal black spot on the primaries has a white pupil in the typical example, obtained by Mr. J. G. Thrupp in Somali-land in 1884, and on this character Dr. Butler gave the name of *T. ocellatus* to the species. In the specimen collected by Dr. A. Donaldson Smith on the Shebeli River, this spot is entirely black, without any sign of a light centre.

Underside.—Similar to that of *T. protractus*, but paler, with the black spots not so much emphasised.

Dr. Butler writes: "I had long expected to see this butterfly before it actually came to hand, as I felt certain that some intermediate form must exist between the salmon-coloured *T. protractus* and the half-salmon, half-white *T. phisadia*. As might be expected, *T. ocellatus* is somewhat nearer to *T. phisadia* than to the Indian species, both in outline and in the general pattern of the primaries. The dry-season form is at present unknown, but it is quite possible that, as in *T. phisadia*, it may only represent the female phase of the species." Expanse 1·5 inch.

HABITAT.—Somali Land.

EXPLANATION OF THE FIGURES OF *T. ocellatus*.

Plate 2, fig. 2. Somali-land (*J. G. Thrupp*). (Type of species; *Mus. Brit.*).

„ 2a. Underside.

TERACOLUS PHISADIA (Godart).

(Plate 3, figs. 1, 1a-1g.)

Pieris phisadia, Godart, Enc. Méth. lx. p. 132, No. 40 (1819).

Pontia arne, Klug, Symb. Phys. Taf. 7, figs. 1-4 (1829).

Idmais phisadia, Boisd. Sp. Gén. i. p. 587, No. 3 (1836); Kirby, Syn. Cat. Diurn. Lepid. p. 499, (1871).

Idmais arne, Boisd. sp. Gén. i. p. 587, pl. 19, fig. 2 (1836).

Teracolus phisadia, Butler, P. Z. S. 1876, p. 136; Swinhoe, P. Z. S. 1884, p. 488; *id.* P. Z. S. 1896, p. 233; *id. tom. cit.* p. 245, pl. x. fig. 13; Guy Marshall, P. Z. S. 1897, p. 10; Butler, Ann. and Mag. Nat. Hist. (6), xx. p. 389 (1897).

Idmais philamene, Mabille, C. R. Ent. Belg. xxxiii. p. cvi. (1880); *id.* in Grandid. Hist. Nat. Madag. p. 284, pl. xli. figs. 10, 10a (1887).

Teracolus arne, E. M. Sharpe, P. Z. S. 1896, p. 527.

MALE.—Allied to *T. protractus*, but is at once distinguished by the central portion of the secondaries being white, with a broad black marginal border. The basal area is slightly suffused with grey, extending along the sub-median nervure to the hind-marginal border.

The primaries are salmon-colour, but not nearly so pink or so bright as in *T. protractus*; on the black marginal border, near the apex, are three light salmon-coloured spots. There is a very distinct discoidal spot of black, and the base of the wing has a pronounced shade of bluish-grey.

Underside.—Resembles that of *T. protractus*. Expanse 1·6 inch.

FEMALE.—As Mr. Guy Marshall has pointed out in the "Proceedings" for 1897 (p. 10), there appear to be four forms of the female, all of which I have myself examined.

I quote Mr. Marshall's remarks on these female specimens: "In this species the male is quite stable, as is the case throughout this group, but the female is very variable, presenting four gradations: (1) like the male; (2) yellow, with the base of the primaries suffused with pink; (3) pure yellow; (4) white. The latter might easily be mistaken for the Indian *T. puellaris*, Butler, but may be distinguished by the curved macular discal stripe on the underside of the secondaries." Besides these phases to which Mr. Guy Marshall has drawn attention, there is apparently yet a fifth form, represented in the British Museum by four specimens from Aden. It is suffused throughout with deep orange (see Plate 3, fig. 1e), and is evidently a dry-season form, corresponding to the phase of *T. rothschildi*, which I have figured (Plate 4, fig. 1e). In addition to these forms enumerated, there is still another form, which passes in collections as *T. arne* of Klug. Of this I have seen both males and females in the collections of the Hon. Walter Rothschild, Mr. Philip Crowley, and in the British Museum. It is smaller than the ordinary type of *T. phisadia* and is apparently a dry-season form, answering to the dry-season form of *T. protractus*, but differing in the more broken character of the apical portion of the primaries, where the light spots are more rounded and not so linear as in *T. protractus*. The secondaries have the basal portion white instead of salmon-colour, and a female in Mr. Crowley's collection has the hind margin of the primaries light orange, so that the black is reduced to a zig-zag sub-terminal band, while the secondaries have the black border interrupted with orange markings near the posterior hind margin.

Underside.—Compared with *T. protractus*, the general colour is very much redder in tint. Expanse 1·7 and 1·4 inch. I have seen specimens of the "*T. arne*" form from Nubia, Somali-land, and from Senegambia.

There is also a pale yellow female in Mr. Crowley's collection marked "Senegambia." This is the specimen figured by me (Plate 4, fig. 1d). Dr. Butler thinks that it is one of the phases of *T. rothschildi*, and if this should turn out to be the case, some mistake may have occurred with regard to the locality of the specimen. As I have, however, no reason to doubt the correctness of the locality, I prefer to think that it is only a strongly marked specimen of the yellow form of *T. phisadia*, which, as we already know, occurs in Senegambia.

Dr. Butler remarks as follows:—"The male of this species is a wet-season form and the female (in all its varieties) invariably dry-season; of course they all fly together at the same time."

HABITAT.—ARABIA: Aden, Jan., Feb., March, April, July, Aug., Sept., Oct., Dec. (*Col. Yerbury*; *Mus. Brit.*); Haithalhim, March (*Col. Yerbury*; *Mus. Brit.*); Lahej, March (*Col. Yerbury*; *Mus. Brit.*); Lahej, Jan. (*Capt. Nurse*; *Mus. P. Crowley*; *Mus. E.M.S.*). SOMALI-LAND. Gellokur, Feb., Dobar, Goolis Mts. Feb., Daras, March (*Coll.*

Mrs. E. Lort-Phillips). SUDAN.—Wadi Gabait, near Suakim, Feb. (*Coll. A. J. Chalmley*); Hor Tamanib (*Mus. Rothschild*). SYRIA (*Bates Coll.*; *Salvin-Godman Coll.*; *Mus. Brit.*). SENEGAMBIA (*Mus. Brit.*; *Mus. H. Grose Smith*; *Mus. P. Crowley*).

Colonel Yerbury has kindly given me the following notes: "Common, though not nearly so common as *T. calais*. Its favourite haunt seems to be the bushes of *Jatropha spinosa*. The larvæ feed, however, on *Salvadora persica*; when young they are pea-green with two black spots on the back of the head and an almost diamond-shaped white mark on the second segment. As they grow older the black spots behind the head disappear, the white diamond becomes more distinct and is outlined in black, while three similar black spots appear on the back—two near together at the centre, of which the hinder one is the larger, and a third on the eleventh segment."

In a paper by Dr. Butler on Captain Nurse's collection (*P. Z. S.* 1896, p. 245, pl. x. fig. 13) there is an illustration of the pupa of *T. phisadia*.

EXPLANATION OF THE FIGURES OF *T. phisadia*.

Plate 3, fig. 1. ♂. Aden, October 10, 1883 (*Col. Yerbury*; *Mus. Brit.*).

„ 1a. Underside.

„ 1b. ♀. Lahej (*Col. Yerbury*; *Mus. Brit.*).

„ 1c. Underside.

„ 1d. ♀. Aden, March 27, 1884 (*Col. Yerbury*; *Mus. Brit.*).

„ 1e. ♀. Aden (*J. J. Walker*; *Salvin-Godman Coll.*, *Mus. Brit.*).

„ 1f. ♀. Aden, April 10, 1884 (*Col. Yerbury*; *Mus. Brit.*).

„ 1g. ♀. Haithalhim, March 23, 1895 (*Col. Yerbury*; *Mus. Brit.*).

Plate 4, „ 1d. ♀. Senegambia (*Mus. P. Crowley*).

TERACOLUS ROTHSCILDI, sp. n.

(Plate 4, figs. 1, 1a–1c, 1e.)

Closely allied to *T. phisadia*, but larger, and with the black of the costal and hind margins more heavily indicated.

MALE.—Primaries with the rose-pink colour confined to a narrow discal band, extending below the costal margin to the middle of the inner margin. The black apical border relieved by two white spots, a third and larger spot of pale pink between the second and first discoidal nervules. Discoidal cell very heavily marked with black, the basal area below the cell being somewhat lighter and suffused with grey. A white line along the inner margin, from the base to the commencement of the inner edge of the black marginal border. Secondaries with the basal area white as in *T. phisadia*, but the black marginal border broader, occupying fully half the wing;

near the costal margin a slight shading of pink; the area between the sub-median nervure and the first discoidal nervule dusted with grey. A distinct white fringe on the hind margin of both primaries and secondaries.

Underside.—Both wings similar to *T. protractus* and *T. phisadia*, having the black spots near the marginal border on the primaries much more pronounced. The black discoidal spot, conspicuous in the former species, is almost obsolete in *T. rothschildi*. Expanse 1.75 inch.

FEMALE.—Exactly like the male in markings, differing only in the black marginal borders being browner, the pink tint everywhere paler and extending over the light area of the secondaries.

Underside.—Similar to that of the male, the general colour being of a much deeper yellow. On the primaries the black markings are much larger and more pronounced, the discoidal spot being more distinct than in the male. The secondaries have an irregular band of reddish-brown extending from the costa to the first discoidal nervule. Expanse 1.85 inch.

There is also in Mr. Philip Crowley's collection another variety of the female, which apparently answers to the orange-coloured form of the female in *T. phisadia*, but is larger. The colour of the specimen before me is brown and orange-buff, the latter tint more pronounced on the secondaries. The broad hind-marginal borders on both wings are broken by a series of variously sized ovate spots of orange-buff, those on the secondaries being nearly obsolete, there is also a minute black dot in the centre of the discoidal cell.

Underside.—Deep yellow, the spots brown and more reduced in size, an irregular band of brownish-red crossing the apical portion of the primaries, uniting with the brown marginal spots; the discoidal cell sulphur yellow, with a dark spot at the end of the cell. Secondaries similar to the primaries, the basal area deep orange, with a distinct light-coloured discoidal spot. There is a band of brownish-red spots varying in size and becoming almost obsolete towards the anal angle. Expanse 1.75 inch.

HABITAT.—Melindi (*Mus. Rothschild*); Mombasa (*Mus. P. Crowley*).

T. rothschildi replaces *T. phisadia* in Eastern Africa, but at present I have not seen many specimens. It is very closely allied to the last-named species, but when the two are compared, the breadth and intensity of the black borders of *T. rothschildi* are apparent enough. It is impossible to say at present whether the female of the present species undergoes all the variations of form which occur in *T. phisadia*, but I expect that the orange-coloured specimen described above may be taken as representing the "dry-season" form.

EXPLANATION OF THE FIGURES OF *T. rothschildi*.

- Plate 4, fig. 1. ♂ . Melindi (type; *Mus. Rothschild*).
 „ 1a. Underside.
 „ 1b. ♀ . Melindi (type; *Mus. Rothschild*).
 „ 1c. Under side.
 „ 1e. ♀ . Mombasa (*Mus. P. Crowley*).

TERACOLUS PUELLARIS, Butler.

(Plate 5, figs. 1, 1a-1d.)

- Teracolus puellaris*, Butler, P. Z. S. 1876, p. 136; Swinhoe, P. Z. S. 1884, p. 509; Guy Marshall, P. Z. S. 1897, p. 10; Butler, Ann. and Mag. Nat. Hist. (6), xx. p. 389 (1897).
Teracolus ochreipennis, Butler, P. Z. S. 1876, p. 136; Swinhoe, P. Z. S. 1884, p. 509.
Idmais puellaris, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 802 (1877).
Idmais ochreipennis, Kirby, *op. cit.* Suppl. p. 802 (1877).
Teracolus rorus, Swinhoe, P. Z. S. 1884, p. 438, pl. xxxix. fig. 8.

MALE.—General colour white, with black marginal borders and white fringe, the distribution of the spots and markings being generally similar to that of *T. phisadia*. Primaries white; costa and hind margin black, the latter being relieved by two white spots near the apex and a third spot, somewhat larger, situated between the second and first discoidal nervules; the base greyish-black, crossing obliquely to the costa, and darkening slightly on the discoidal cell, at the end of which is a very distinct black spot. Secondaries white, with a hind-marginal border of black; the base slightly suffused with grey.

Underside.—General colour sulphur yellow. On the primaries are three spots of black varying in size, the last spot near the posterior angle being very much larger than the two preceding it, and extending along the inner margin. At the end of the discoidal cell is a fourth small spot of black. The secondaries are like the primaries, but the discoidal spot is reduced to a small dot. Expanse 1·4 inch.

FEMALE.—Similar to the male as regards the markings on both the primaries and secondaries, the black marginal borders, however, being browner in colour.

Underside.—Resembles that of the male, both in colour and markings. Expanse 1·5 inch.

The descriptions above are taken from the “wet-season” form (*T. puellaris*), the “dry-season” forms being *T. ochreipennis* and *T. rorus*. They differ in the underside being more sandy-coloured, as has been pointed out by Mr. Guy Marshall (P. Z. S. 1897, p. 11). Some of the females of *T. ochreipennis* are rather more cream-coloured and have the marginal borders of a lighter brown.

HABITAT.—North-Western India.

SIND.—Larkhana, July (*Mus. C. Swinhoe et W. Rothschild*); Sukkur, January (*C. Swinhoe*; *Mus. Brit.*; type of *T. rorus*); Hyderabad (*Mus. C. Swinhoe*); Karachi (*Mus. C. Swinhoe*); Hubb River, 25 miles from Karachi (*C. Swinhoe*; *Mus. Brit.*); Bhooj (*Mus. C. Swinhoe*).

GUZERAT.—(*Mus. J. Davidson et W. Rothschild*); Deesa (*Mus. W. Rothschild*).

KUTCH.—(*Mus. Brit.*).

PUNJAB.—Wurzeerabad (*Gen. Hearsey*; *Mus. Brit.*; type of species); Barrackpur (*Gen. Hearsey*; *Mus. Brit.*; type of *T. oehreipennis*); Chitta Pahar and Campbellpur (*Col. Yerbury*; *Mus. Brit.*; Butler, P. Z. S. 1886, p. 355); Kandesh (*J. Davidson*).

Mr. J. Davidson writes to me: "In the same village in Kandesh where I met with *T. amatus*, I found a butterfly of this type abundant, but even there it was restricted to one hedge, which no doubt contained its food-plant. I never saw the butterfly elsewhere except on the border between Kathiawar and Guzerat, where it swarmed in November and December 1892. In both places I found specimens in which the lowest black spot on the outer angle of the fore-wing underneath extended below the sub-median nervure. With regard to "Section D." (*T. vestalis* and *T. puellaris*, cf. Watson, Journ. Bomb. Nat. Hist. Soc., vol. viii. pp. 520, 521) I can only make out one species.

Dr. Butler makes the following remarks: "Occurs from Kutch, to Karachi, through Sind northwards as far as Beluehistan, both dry- and wet-season forms flying together; the form with yellow under surface, which is the wet-season representative, is *T. puellaris*, and that with the apex of primaries and the whole of the secondaries sandy buff on the under surface, which is the dry-season type, is *T. oehreipennis* (= *T. rorus*). We have both forms captured on the 29th of June and in November. It is therefore evident that, as in some other dry localities, the seasonal forms in this species represent mere varieties which appear simultaneously. Among Hewitson's examples of *T. phisadia* is a male of the wet-season form labelled 'Aden'; but this must surely be an error, unless the white females referred to *T. phisadia*, and obtained at my request by Col. Yerbury, flying with the latter species, actually belong to the dry-season variety *T. puellaris*. This, however, is extremely improbable."

EXPLANATIONS OF THE FIGURES OF *T. puellaris*.

Plate 5, fig. 1. ♂. Kutch, Dec. 1879 (*Mus. Brit.*).

„ 1a. Underside.

„ 1b. ♀. Karachi (*C. Swinhoe*, *Mus. Brit.*).

„ 1c. Underside.

„ 1d. ♀. Campbellpur, June 1886 (*Col. Yerbury*, *Mus. Brit.*).

TERACOLUS VESTALIS, Butler.

(Plate 6, figs. 1, 1a-1f.)

Teracolus vestalis, Butler, P. Z. S. 1876, p. 135, pl. vii. fig. 10; Swinhoe, P. Z. S. 1884, p. 509; Guy Marshall, P. Z. S. 1897, p. 11; Butler, Ann. and Mag. Nat. Hist. (6), xx. p. 390 (1897).

Idmais vestalis, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 802 (1877).

Teracolus intermissus, Butler, P. Z. S. 1883, p. 152, pl. xxiv. fig. 4.

Teracolus peelus, Swinhoe, P. Z. S. 1884, pp. 439, 509, pl. xxxix. fig. 9.

Teracolus dubius, Swinhoe, P. Z. S. 1884, pp. 439, 509.

MALE.—Closely allied to *T. puellaris*, the only apparent difference being that it is slightly larger.

Underside.—Primaries very similar to those of *T. puellaris*, the third black spot near the posterior angle above the sub-median nervure being smaller and not extending along the inner margin, as in *T. puellaris*. The secondaries do not differ from the primaries in colour. Expanse 1·4 inch.

FEMALE.—Like the male as regards the markings, the black marginal borders being somewhat browner.

Underside.—Only differs in having an irregular discal band on the secondaries, from the costa to the first discoidal nervule. In some of the specimens which I have examined, this band is nearly obsolete. Expanse 1·6 inch.

After careful examination of a good series lent to me by the Hon. W. Rothschild, Colonel Swinhoe, and Mr. Crowley, I cannot separate *T. dubius* from *T. vestalis*, both being the "wet-season" representative, as pointed out by Mr. Guy Marshall and Dr. Butler. *T. dubius* is only a larger and more heavily marked form, not differing from *T. vestalis* in any other respect that I can see.

Colonel Swinhoe observes in a letter to me: "*T. dubius* is always uniformly much the larger with the black bands broader, otherwise there is not much difference."

T. intermissus is the "dry-season" form, being very much smaller and having the marginal borders much reduced on both wings. The underside is very bright sandy colour on the secondaries, the same colour being strongly indicated on the apex and hind-margin of the primaries. *T. peelus* is the yellow female of *T. intermissus*.

HABITAT.—North-Western India westwards to Southern Persia.

SIND.—Karachi, April to September (*Mus. C. Swinhoe*, *Mus. W. Rothschild*, et *Mus. Brit.*); August (*Mus. Brit.*, yellow ♀, type of *T. peelus*); September (*Mus. Brit.* ♂ ♀, types of *T. dubius*); November (*Mus. Brit.*, type of *T. intermissus*); Sukkur (*Mus. C. Swinhoe*); Hyderabad (*Mus. C. Swinhoe*); Hubb River, twenty-five miles from Karachi, August (*C. Swinhoe*, *Mus. Brit.*).

KURCH.—(*Mus. Brit.*).

PUNJAB.—Campbellpur (*Col. Yerbury*; Butler, P. Z. S. 1886, p. 355).

S. PERSIA.—Fao (*W. D. Cumming*); Bushire, September (*W. D. Cumming, Mus. Brit.*).

Mr. Guy Marshall writes: "This species is very nearly allied to the last, and is perhaps doubtfully distinct. However, a few small distinctions appear to be constant: thus, *T. vestalis* is larger, with the black border on upper side of secondaries proportionately narrower; on the underside of primaries the lowest of the three black spots near posterior angle is small and well defined, but in *T. puellaris* it is large and suffused along inner margin; lastly, the females of *T. vestalis* have a macular discal ray on the underside of secondaries, which appears to be absent in *T. puellaris*. With regard to the synonymy, *T. vestalis* and *T. dubius* are the same; *T. intermissus* is the dry-season form, and *T. peelus* is merely the yellow female of it. This species has much the same range as *T. puellaris*, but has been recorded a little farther west, namely Fao, in the Persian Gulf."

Dr. Butler's remarks on this species are as follows: "Occurs from Kutch through Karachi and Beluchistan to the coast of Persia. The varieties representative of seasonal forms in this species fly together in April, May and June, but we have only received the dry-season types as obtained in November and December. The wet-season type is typical *T. vestalis* (= *T. dubius*); the dry and intermediate types are represented by *T. intermissus*, of which *T. peelus* is only a yellow female form, Swinhoe's supposed male being merely a small example."

EXPLANATION OF THE FIGURES OF *T. vestalis*.

Plate 6, fig. 1. ♂. Karachi, June 1880 (*C. Swinhoe; Mus. Brit.*).

„ 1a. Underside.

„ 1b. ♀. Fao, Persian Gulf, August 1889 (*W. D. Cumming; Mus. Brit.*).

„ 1c. ♀. (*T. ochreipennis*, Butl.) India (*Mus. Brit.*).

„ 1d. ♂. (*T. intermissus*, Butl.) Karachi, December 1881 (*C. Swinhoe, Mus. Brit.*).

„ 1e. Underside.

„ 1f. ♂. (*T. peelus*, Swinhoe.) Karachi, May 1882 (*C. Swinhoe; Mus. Brit.*).

TERACOLUS CASTALIS, Staud.

(Plate 7, figs. 1, 1a-1e.)

Idmais castalis, Staudinger, Exot. Schmett, p. 43, pl. xxiii. fig. 4 (1884); E. M. Sharpe, P. Z. S. 1896, p. 526.

Teracolus castalis, Guy Marshall, P. Z. S. 1897, p. 11; Butler, Ann. and Mag. Nat. Hist. (6), xx p. 390 (1897).

Very nearly allied to *T. puellaris* and *T. vestalis*, of which it is the African representative. It is distinguished, however, by the more pointed primaries and by the black marginal border on the secondaries being more broken and relieved by white spots.

MALE.—With the black hind-marginal border on the primaries terminating in an extra spot of white near the posterior angle; costa more heavily marked with black, the discoidal spot at the end of the cell being very clearly defined. The grey at the base of the primaries is also much stronger in colour and crosses the wing obliquely from the centre of the cell to the inner margin.

Secondaries with the black marginal border entirely broken by a row of white spots varying somewhat in size and disappearing in some specimens, above the second discoidal nervule. A distinct grey streak is visible close to the base of the wing.

Underside.—Primaries with the costal margin, apex and hind-margin bright yellow, as far as the first discoidal nervule. Crossing the apex is a faint row of reddish-brown spots, which unite with three black spots near the hind-margin as in *T. vestalis*, but they are not so pronounced; and the lowest one, above the sub-median nervure, is nearly obsolete. The discoidal spot is orange outlined with black. The secondaries are bright yellow, with a sub-marginal row of irregular reddish-brown spots, commencing from the costa and becoming nearly obsolete above the first discoidal nervule; there is also a minute orange spot at the end of the cell. Expanse 1.5 inch.

FEMALE.—Primaries very similar to those of the male, but with the black markings browner, base of wing greyish-brown. Secondaries with the brown marginal border entirely broken by a row of white spots.

Underside.—Pale yellow, the primaries having a sub-marginal row of reddish-brown spots from the costa to above the sub-median nervure, the orange discoidal spot larger secondaries similar to those of the male, the sub-marginal row of reddish-brown spots being more irregular. Expanse 2 inches.

This species appears to be confined to East Africa, where it ranges from the district of Mombasa and Teita to Somali Land. Specimens seem to be rather rare in collections, and I have therefore not had a good series to work from. They are all "wet-season" examples, two males in Mr. Jackson's collection being very dark, the marginal border on the secondaries having no white spots (*cf.* plate 7, fig. 1d), but these are present in a female in Mr. Rothschild's collection, which represents the "dry-season" form.

HABITAT.—East Africa and Somali Land.

EAST AFRICA.—Mombasa (*Slingsby Godfrey*; *Mus. P. Crowley, E. M. S.*; *et Mus. Brit.*); Melindi (*Mus. W. Rothschild*); Teita (*Mus. W. Rothschild*). Between Maungu

and Tsavo River, December and January (*F. J. J.*; *Mus. F. J. Jackson*). Elgeyo, July (*F. J. J.*; *Mus. F. J. Jackson*).

SOMALI LAND.—Daras-as, Goolis Mountains February (*Mrs. E. Lort-Phillips*; *E. M. Sharpe*, *P. Z. S.* 1896, p. 526).

EXPLANATION OF THE FIGURES OF *T. castalis*.

Plate 7, fig. 1. ♂. Between Maungu and Tsavo River, Dec. 1891–Jan. 1892 (*Mus. F. J. Jackson*).

- „ 1a. Underside.
- „ 1b. ♀. Elgeyo, July 1890 (*Mus. F. J. Jackson*).
- „ 1c. Underside.
- „ 1d. ♂. Elgeyo, July 1890 (a dark seasonal form; *Mus. F. J. Jackson*).
- „ 1e. Underside.

TERACOLUS JOHNSTONI, Butler.

(Plate 8, figs. 1, 1a–1f.)

Teracolus johnstoni, Butler, *Ent. Monthly Mag.* xxiii. p. 29 (1886); *id.* *Ann. and Mag. Nat. Hist.* (6), xx. p. 391 (1897).

Idmais eris (nec Klug), Westwood in Oates, *Matabeleland*, App. p. 336 (1881); *Staud. Exot. Schmett.* taf. 23, fig. 1 (1884).

Teracolus eris (nec Klug), Trimen, *S. Afr. Butterfl.* iii. p. 93 (1889, pt.); *Guy Marshall*, *P. Z. S.* 1897, p. 7 (pt.).

MALE.—General colour [white, with black and yellow marginal markings: the central area on the primaries white, which is somewhat toothed towards the hind-margin. A narrow band of black below the apical portion widens into a broad hind-marginal border extending along the inner margin, but becomes narrower towards the base of the wing. The apex has a violaceous brown patch relieved by five hastate markings of golden yellow which vary in size. Between the second and third median nervule is a white spot, which, in some specimens, is nearly obsolete. Fringe yellow as far as the second median nervule, when it becomes white. The secondaries are creamy white with a broad incurved costal border of black, terminating somewhat abruptly about the end of the costal nervure. The base of the wing is dusted with black, which extends to about the sub-median nervure. On the hind-margin each nervule terminates in a minute black spot.

Underside.—Primaries and secondaries white, the former having a black twin spot above the sub-median nervure and two larger ones between the second and third median nervules. On the costal margin of the secondaries is a narrow streak of orange yellow, as well as a spot at the end of the discoidal cell of the same colour. Expanse 2 inches.

FEMALE.—Creamy white, the dark marginal borders browner than in the male; the sub-apical row of spots deeper yellow rather than golden yellow, and a distinct circular indentation at the posterior angle of creamy white. At the end of the discoidal cell is a very distinct brown spot. Secondaries creamy white, the base being dusted with greyish-black, the nervules terminating on the hind-margin in distinct brown spots, which are much more emphasised than in the male.

Underside.—Rather a deeper yellow on the secondaries, the dark markings being similar to those of the male. Expanse 2 inches.

“DRY-SEASON” FORM. The male is distinguished by a very plainly indicated black discoidal spot at the end of the cell. The apical patch is much brighter golden yellow, and the white fringe below the second median nervule is more pronounced. The secondaries show no black spots at the end of the nervules.

Underside.—Primaries white with the characteristic spots smaller. Secondaries sandy yellowish, the orange costal line terminating in a dark spot. Expanse 2 inches.

FEMALE of the “dry-season” form. Shows a somewhat striking difference. Both wings are pale yellow, the apex reddish buff, relieved by three deeper yellowish spots. A transverse band of dark brown crosses towards the hind-marginal border and is connected by a narrow line with the darker brown border of the inner margin. There is also the characteristic yellow posterior spot, as well as the dark spot at the end of the discoidal cell.

The secondaries are nearly uniform, but show two reddish-brown spots between the costal and sub-costal nervures.

Underside.—Central area of the primaries pale yellow, the apex and secondaries being sandy buff, while the three dark marginal spots on the primaries are much reduced. Expanse 2 inches.

In another extreme “dry-season” (form Fig. 1f) considerable differences are exhibited from the one described above. The brown markings are much reduced in extent, and the yellowish-white of the primaries is more extended. Thus the white of the hind-margin is continued up towards the costa, so that it separates a pale reddish-brown apex from the dark brown inner band; the latter is not continued to a junction with the dark inner margin, as in the specimen previously described, but is represented by a couple of brown spots. The discoidal spot is strongly in evidence, as are also the two brown spots near the apical portion of the secondaries. The underside is very similar to that of fig. 1c, but is even more sandy yellow, the sub-marginal row of spots on the primaries being more distinct. Expanse 2 inches.

HABITAT.—S.E. Africa, from the Eastern Cape Colony north to Manica Land.

SOUTH-EAST AFRICA.—Eastern Cape Colony. Grahamstown (*J. C. M. Johnston; Mus. Brit.*); Zwaart-water Kloof (*Trimen, l.c.*); Albany District (*Trimen, l.c.*);

Tharfield, Bathurst District (*Miss M. L. Bowker; Trimen, l.c.*); Uitenhage (*S. D. Bairstow; Trimen, l.c.*); Bedford (*J. P. Mansel Wcale; Trimen, l.c.*); Seymour, Stockenstrom District (*W. C. Scully; Trimen, l.c.*); Kingwilliamstown (*C. G. Barrett; Mus. Brit.; W. S. M. D'Urban; Trimen, l.c.*); Windvogelberg, Queenstown District (*Mrs. Barber; Trimen, l.c.*).

Griqualand West. Vaal River (*J. H. Bowker; Trimen, l.c.*).

Caffraria Proper. Bashee River (*J. H. Bowker; Trimen, l.c.*).

Natal. Greytown (*Trimen, l.c.*); Weenen (*J. M. Hutchinson; Mus. Rothschild*); Tugela River (*Guy Marshall*); Bushman's River (*J. M. Hutchinson; Mus. Brit.*).

Swaziland (*E. C. Buxton; Trimen, l.c.*).

Zululand. Umkusi (*R. B. & J. D. S. Woodward*) m.; Black Umfolozi River (*Cecil Barker; R. B. & J. D. S. Woodward; Mus. Rothschild*). Hlatikulu (*R. B. & J. D. S. Woodward; Mus. E. M. S.*).

Transvaal. Pretoria, Feb. (*Distant, Nat. Transv. p. 234*); Potchefstroom (*W. Morant; T. Ayres; Trimen, l.c.*). Marico (*F. C. Selous; Trimen, l.c.*). Limpopo River (*A. W. Erickson; Trimen, l.c.*). Origstadt Valley, Lydenburg District (*T. Ayres; Trimen, l.c.*).

Matabeleland. Tati and Ramaqueban River, July (*F. Oates; Westwood, l.c.*).

Manica Land (*F. C. Selous; Trimen, P. Z. S. 1894, p. 65, s. n. T. cris*).

This species, as far as I have been able to determine from specimens, appears to range from the Grahamstown District in the Eastern Cape Colony to Natal (*T. eris*, Trimen, *S. Afr. Butt. iii. p. 97*) and thence to Zululand and the Transvaal, where Mr. Distant met with it near Pretoria (*T. eris*, Distant, "A Naturalist in the Transvaal," p. 234, 1892), thence northwards to Matabeleland (*T. eris*, Westwood, Oates, "Matabeleland," App. p. 336, 1881) and the Manica country (*T. eris*, Trimen, *P. Z. S. 1894, p. 65*). As, however, I have not seen specimens from the last named localities, I am unable to determine as to whether they are really *T. johnstoni* or referable to *T. opalescens*. A subsequent examination may prove that some of them are *T. opalescens*. The geographical range, however, of *T. johnstoni* seems to be quite natural, and I shall await the confirmation of the distribution which I have here assigned to it.

Of the *T. cris* group of the genus *Teracolus*, Dr. Butler recognises four species, while Mr. Guy Marshall and Dr. Trimen admit but one. The variation in colour of the female, in this section of the genus, is certainly somewhat extreme, and the series which I have examined in different collections has not been sufficient for me to give the exact geographical distribution of the forms admitted by Dr. Butler.

Nevertheless, I have considered it best to follow Dr. Butler's arrangement of this group in the British Museum, and I therefore quote his remarks as follows: "Ranges

in South Africa from Grahamstown to Natal, beyond which point it is probably replaced by *T. opalescens*. It is one of the smallest of the *T. eris* group, being (in its largest examples) only slightly superior in size to the typical form, from which it differs in its more elongated primaries, the more elongate form of the white area on these wings and the apical ochraceous streaks or internervular spots, the less heavily bordered inner marginal black border on the primaries of the female, and the more abruptly terminated black costal band on the secondaries, which emits an acute streak to the apex along the costa, instead of being extended transversely almost to the radial vein." Mr. Cecil Barker procured the species on the Umfolozi River, Zululand, where he makes the remark that it frequents the "thorn bush country." Dr. Trimen writes: "I know of no part of South Africa where this widely-ranging African species is at all numerous. I saw a few examples in the 'Thorn' country near Greytown, in Natal; they were males, and flew with great rapidity. This was in March 1867, and the only other opportunity I had of seeing the butterfly in life was in January and February 1870, in the Albany district of the Cape Colony, where I captured one of each sex."

"Mr. W. Morant sent me some specimens from near Pochefstroom, with the note that they were taken on the 25th of February about a stony kopje, and flew very strongly. Mr. D'Urban found the species near King William's Town in March and April."

EXPLANATION OF THE FIGURES OF *T. johnstoni*.

Plate 8, fig. 1. ♂. South Africa (*Mus. Brit.*).

„ 1a. Underside.

„ 1b. ♀. Umfolozi River, Zululand (*C. H. Barker Coll.*).

„ 1c. Underside.

„ 1d. ♂. King William's Town (*C. G. Barrett; Mus. Brit.*).

„ 1e. ♀. King William's Town (*C. G. Barrett; Mus. Brit.*).

„ 1f. ♀. Graham's Town (*G. M. C. Johnston; type, Mus. Brit.*).

„ 1g. Underside.

TERACOLUS ERIS (Klug).

(Plate 9, figs. 1, 1a-1g.)

Pontia eris, Klug, Symb. Phys. Ins. pl. vi. figs. 15, 16 (1829).

Pieris eris, Boisd. Sp. Gén. Lép. i. p. 514, n. 111 (1836).

Anthocharis eris, Reiche, Ferret and Galinier, Voy. Abyss. Ent. p. 460, pl. 3, figs. 1-3 (1849).

Idmais fatma, Felder, Reis. Novara, Lepid. p. 189, pl. xxv. fig. 3 (1865 = ♀).

Idmais eris, Kirby, Syn. Cat. Diurn. Lepid. p. 499, n. 12 (1871).

Teracolus abyssinicus, Butler, Ann. and Mag. Nat. Hist. (4), xvii. p. 486 (1876).

Teracolus agoye, (nec. Wallengr.), Butler, P. Z. S. 1894, p. 572; E. M. Sharpe, P. T. S. 1896, p. 535.

Teracolus eris, Butler, P. Z. S. 1876, p. 127.

Idmais abyssinicus, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 801 (1877).

Teracolus eris, Trimen, P. Z. S. 1891, p. 97; *id.* P. Z. S. 1894, p. 65; E. M. Sharpe, P. Z. S. 1894, p. 348; Guy Marshall, P. Z. S. 1897, p. 7; Butler, *l.c.* p. 693; *id.* Ann. and Mag. Nat. Hist. (6) xx. p. 391 (1897).

MALE.—Very similar to that of *T. johnstoni*, but the golden yellow apical patch on the primaries seems to be more reduced in size and has a more violaceous gloss; the white spot between the second and third median nervule is nearly obsolete, being entirely absent in some specimens; the white central area is not so much toothed as in *T. johnstoni*. The secondaries are similar in colour to those of the latter species, but the broad black costal border extends more towards the middle of the discoidal nervule.

Underside.—Not to be distinguished from that of *T. johnstoni*. Expanse 1·10 inches.

FEMALE.—Having the same markings as in the corresponding stage of *T. johnstoni*, but the general colour is sulphur-yellow instead of white. The sub-marginal row of spots on the secondaries appears to be more pronounced than in *T. johnstoni*.

Underside.—Rather lighter than the upper surface, the primaries being marked like those of the male. Secondaries similar to the primaries in colour, having the deep orange streak along the costal margin and a distinct discal row of small spots situated between the nervules: these are generally absent in the females of *T. johnstoni*, although occasionally faint indications of them may be observed. Expanse 2·1 inches.

The type of *T. abyssinicus*, Butler (Fig. 1d), is of a much deeper yellow than the ordinary "wet-season" female and the brown markings are much heavier in every way, the pale spots near the apex being almost obsolete, and the brown on the inner margin also deeper in colour and more suffused over the base. On the secondaries the nervular spots unite, thus forming a distinct hind-marginal border; the base is also more heavily dusted. The underside is very similar to that of the example from Abyssinia figured (Plate 9, fig. 1c), the general colour being a little deeper yellow, the nervules of both wings terminating in dark spots. Expanse 2·1 inches.

"DRY-SEASON" FORM.—Only represented by one specimen in the British Museum, and is apparently *T. fatma* of Felder. The apical patch on the primaries is tawny brown as far as the first median nervule. There is also a row of disconnected discal spots, the inner margin being entirely white. A few of the specimens in Mr. Rothschild's collection from East Africa show a very faint indication of the usual dark streak along the inner margin. The secondaries are entirely without spots.

Underside.—The whole of the primaries white with the exception of the apex and

the secondaries, which are yellow, relieved by the usual markings described in the foregoing examples. Expanse 2 inches.

The females in Mr. F. J. Jackson's collection from East Africa correspond with the type of *T. abyssinicus* in the markings, the difference being that the ground-colour is entirely white; one specimen, however, has the sub-apical row of spots whiter and larger. In Mr. Rothschild's collection there are two females of the yellow form, but the brown markings are less pronounced and more like those of the "dry-season" form (Fig. 1f, = *T. fatma*), which is well represented by seven females collected by Dr. W. J. Ansorge at N'di, Tsavo, Mauungu, and Taru, in the Rothschild collection.

HABITAT.—SUDAN. Nubia, Ambukol (*Klug*). Kordofan (*Felder, l.c.*); Atbara River (*Mus. Brit.*).

SOMALI-LAND.—Arusa Galla Country, Nov. (*F. Gillett; Mus. Brit.; Butler, P. Z. S. 1897, p. 693*).

EAST AFRICA.—Turquel, Jan. (*F. J. Jackson*); Rabai Hills, July (*F. J. J.*); Elgeyo, July (*F. J. J.*); Njemps, July (*F. J. J.*); Teita District; Kibwezi, Dec. (*F. J. J.*); Mauungu to Tsavo River, Dec. and Jan. (*F. J. J.*); Mauungu to Maragoyakanga, Jan. (*J. W. Pringle; E. M. Sharpe, P. Z. S. 1894, p. 348*); Teita to Voi River, Jan. (*J. W. Pringle; E. M. Sharpe, l.c.*); N'di (*Dr. J. W. Ansorge; Mus. Rothschild*); Sabaki Valley (*Hampson, Ann. and Mag. Nat. Hist. (6) xii. p. 181 (1891); Dr. J. W. Gregory; Mus. Brit.; (Butler, P. Z. S. 1894, p. 572)*). Mombasa (*Mus. Rothschild*); Zanzibar (*Dr. J. W. Ansorge; Mus. Rothschild*); Kilimanjaro (*Bishop Hannington; Mus. Brit.*).

WEST AFRICA.—"Senegambia" (*Coll. Druce; Mus. Brit.*).

T. eris is the typical form, of which four races have been recognised by various authors. It is distinguished, in its "wet-season" phase, by having no white spot near the margin of the primaries between the second and third discoidal nervules. It was first described by Klug, from Ambukol in Nubia.

The *Idmais fatma* of Felder, from Kordofan, is the "dry-season" form of the female. Other examples from the Atbara River are in the British Museum; they were purchased of Mr. Gerrard, and probably formed part of the collection made by Mr. Esler.

Mr. F. Gillett procured a specimen in the Arusa Galla Country. The specimen from Dr. Gregory's Expedition, believed to have been taken in the Sabaki Valley, and referred by Dr. Butler to *T. agoye* (*P. Z. S. 1894, p. 572*) is now considered by him to be referable to *T. eris* (*Ann. and Mag. Nat. Hist. (6) xx. p. 391*).

Numerous specimens from the Teita District have been examined by me, and a male said to have been collected in the Kilimanjaro region by Bishop Hannington is in the British Museum. I should mention, however, that these Teita specimens

cannot be considered absolutely typical; in fact, I look upon them as a distinct race which may be called *T. teitensis*, for they have the white spot on the primaries, between the second and third discoidal nervules, more or less pronounced.

The British Museum has likewise several specimens of *Teracoli*, said to be from Senegambia, from the Salvin-Godman collection; these were formerly in the collection of Mr. Herbert Druce. Two of these appear to be true *T. eris*, but whether they came from Senegambia has yet to be determined.

EXPLANATION OF THE FIGURES OF *T. eris*.

- Plate 9, fig. 1. ♂ Kilimanjaro (Bishop Hannington; Mus. Brit.).
 „ 1a. Underside.
 „ 1b. ♀ Abyssinia (Mus. Brit.).
 „ 1c. Underside.
 „ 1d. ♀ Abyssinia (Type of *T. abyssinicus*).
 „ 1e. Underside.
 „ 1f. ♀ Sabaki Valley (Dr. J. W. Gregory; Mus. Brit.).
 „ 1g. Underside.

TERACOLUS OPALESCENS, Butler.

(Plate 10, figs. 1, 1a-1g.)

Teracolus opalescens, Butler, Ent. Month. Mag. xxiii. p. 30 (1886; ♀); *id.* P. Z. S. 1896, p. 125 (♂); *id.* P. Z. S. 1896, pp. 835, 852; *id.* Ann. and Mag. Nat. Hist. (6) xx. p. 391 (1897).

Teracolus opalinus (lapsu), Guy Marshall, P. Z. S. 1897, p. 7.

This species is distinguished at a glance by the yellow streak on the underside between the sub-median and first median nervules of the secondaries.

MALE.—With the white central area on the primaries much reduced, the hind and inner marginal borders being broader and more heavily marked than in *T. johnstoni* and *T. eris*; the apical patch larger, with a brown violaceous gloss; the ground-colour relieved by five ovate streaks of “old gold,” much more pronounced than in the foregoing species. There is the usual white spot between the discal nervules, but the white marginal fringe at the posterior angle is not so plainly indicated. Secondaries with a very broad, black, curved, costal border extending along the second and first sub-costal nervules, the border showing an indication to form a discal band. Each of the nervules terminates in very pronounced black spots.

Underside.—Similar in markings to *T. johnstoni* and *T. eris*, the general colour being pale yellow, the primaries having the characteristic post-median spots more heavily marked than in the above-named species, the nervules terminating on both

wings in minute black spots. Expanse 2·8 inches. (*Spec. ex. Nyasa-land; H. H. Johnston; Mus. Brit.*)

FEMALE.—Similar to that of *T. eris* (Plate 9, fig. 1d) as regards the markings, the general colour being creamy white instead of yellow. It is much larger than that of any of the allied species.

Underside.—Resembles that of the male above described, but with the ground colour of rather a deeper yellow. The orange costal margin and the inter-nervular streak are brighter and more strongly marked on the secondaries, and there is a faint indication of a sub-nervular row of dark spots across the discal area. A black spot is visible at the end of the discoidal cell, as in the allied species. Expanse 2·8 inches. (*Spec. ex. Nyasa-land; H. H. Johnston; Mus. Brit.*)

The type of *T. opalescens* (Plate 10, fig. 1d) is a female from Delagoa Bay, and is white with brown marginal borders, the inner marginal border being much narrower than in the female described (Plate 10, fig. 1b).

Underside.—Central area on the primaries white, the apex yellow with no black spots at the end of the nervules, and the three black post-median spots somewhat smaller than in *T. eris*. Secondaries entirely yellow, with a row of dark inter-nervular spots crossing the discal area, and very distinct. There are no black spots at the end of the nervules. The orange markings are rather paler than in *T. eris*, but are still distinctly visible. Expanse 2·8 inches.

Another form of the female which Dr. Butler has advised me to figure (Plate 10, fig. 1e) is very similar to Fig. 1b in the markings, with the exception that it is smaller and the ground-colour is sulphur-yellow in both primaries and secondaries. The underside does not differ in colour from the upper side except that the central area of the primaries is pale yellow instead of white. Expanse 2·5 inches. (*Spec. ex. Nyasa-land; H. H. Johnston; Mus. Brit.*)

The “dry-season” form of the male is very similar to that of *T. johnstoni*, the only difference being the absence of the discoidal spot, while the white at the posterior angle is almost invisible. The “old gold” markings are very strongly indicated and the violaceous gloss is well in evidence. The secondaries do not differ from those of *T. johnstoni*.

Underside.—Entirely sandy-pink with the exception of the central area of the primaries, which is white. On the secondaries there is an inter-nervular row of minute dark spots crossing the discal area. Expanse 2·4 inches. (*Spec. ex. Bangara, Nyasa-land, Aug. 18, 1895; R. Crawshay; Mus. Brit.*)

The “dry-season” form of the female is somewhat allied to that of *T. johnstoni*, the ground-colour being sulphur-yellow, with a sub-apical row of reddish-buff spots on the primaries, not very distinct. The secondaries are almost without markings, the nervular spots being very indistinct.

Underside.—Similar to that of the male, but a little more inclined to sandy-buff. The characteristic post-median spots are larger than in the male, and have an additional posterior row of spots, which, however, are not very strongly indicated. The secondaries do not differ from those of the male. Expanse 2·4 inches. *Spec. ex. Nyasa-land*; *Salvin-Godman Coll.*; *Mus. Brit.*)

HABITAT.—From Delagoa Bay to Nyasa-land, and north to Victoria Nyanza. Delagoa Bay (*J. M. C. Johnston*; *Mus. Brit.*; *Mus. Rothschild*). Nyasa-land (*H. H. Johnston*; *Mus. Brit.*). Lake Nyasa (*Thelwell*; *Salvin-Godman Coll.*; *Mus. Brit.*). Fort Johnston, Nyasa-land (*Dr. P. Rendall*; *Mus. Brit.*). Likoma, Nyasa-land, Jan. 24, 1896 (*Rev. Percy Faulkner*; *Mus. Rothschild*); Menga, W. of Lake Nyasa, Jan. 30, 1895 (*R. Crawshay*; *Mus. Brit.*); Bangara, Aug. 18, 1895 (*R. Crawshay*; *Mus. Brit.*; *Butler, P. Z. S.* 1896, p. 835); Victoria Nyanza (*Bishop Hannington*; *Mus. Brit.*).

This species I consider to be quite distinct, on account of the strongly marked inter-nervular streak of orange on the secondaries; it is also larger than the allied forms, and is more heavily marked with black.

Dr. Trimen, however, does not consider its large size sufficient to warrant the separation of *T. opalescens* from the variable series of the female *T. eris*. Mr. Guy Marshall also considers the type to be only a large female of *T. eris* (*P. Z. S.* 1897, p. 7).

Dr. Butler (*Ann. and Mag. Nat. Hist.* (6) xx. p. 392) reiterates the characters on which he separated this species, and calls attention to the "much broader orange-yellow costal streak" on the secondaries. He writes: "Of our eight females three ought to be called unusually large, four fairly large, and one rather small; but the name *opalescens* was given to the type because it was faintly opalescent on the upper surface, and on the under-surface of the primaries, a character which I have since discovered to be inconstant, as also is the width of the internal black bordering of the primaries, which is frequently as wide again as in the type. The dry-season form is smaller than that of the wet-season, the primaries comparatively shorter and broader than in *T. johnstoni*, with the conspicuous black discal spots below which characterise the wet-season form, and with a series of sealy brown spots across the under-surface of the secondaries between the nervules. These characters and the lack of the black disco-cellular spots readily distinguish it from the dry form of the southern species."

EXPLANATION OF THE FIGURES OF *T. opalescens*.

Plate 10, fig. 1. ♂ Nyasa-land (*H. H. Johnston*; *Mus. Brit.*).

„ 1a. Underside.

„ 1b. ♀ Nyasa-land (*H. H. Johnston*; *Mus. Brit.*).

„ 1c. Underside.

- Plate 10, fig. 1d. ♀ Delagoa Bay (*J. M. C. Johnston*; type, *Mus. Brit.*).
 „ 1e. ♀ Nyasa-land (*H. H. Johnston*; *Mus. Brit.*).
 „ 1f. ♂ Bangara, Nyasa-land (*R. Crawshay*; *Mus. Brit.*).
 „ 1g. Underside.
 „ 1h. ♀ Lake Nyasa (*Thelwell*; *Salvin-Godman Coll.*; *Mus. Brit.*).
 „ 1i. Underside.

TERACOLUS MAIMUNA (Kirby).

(Plate 11, figs. 1, 1a-1g.)

Idmais maimuna, Kirby, Proc. Roy. Dublin Soc. (2) ii. p. 338 (1880); Waterhouse, Aid Ident.

Ins. ii. pl. cxliii. figs. 1, 2 (1882-90).

Teracolus maimuna, Butler, Ann. and Mag. Nat. Hist. (6) vii. p. 46 (1891); *id.* t.c. (6) xx. p. 392 (1897).

Teracolus eris, pt. Guy Marshall, P. Z. S. 1897, p. 7.

MALE.—As large as *T. opalescens*, but with the white central area on the primaries larger, owing to the black border on the inner margin being more restricted. The white area is more oval in shape and not so toothed as in *T. opalescens*; the apical patch has the violaceous brown gloss well pronounced and is relieved by four ovate yellow streaks, not so bright in colour as in any of the species before described. The white spot situated between the second and third median nervules is very distinct. The secondaries do not differ from those of *T. opalescens*, with the exception that the white basal area is much more extended towards the costa than in the allied forms, so that the characteristic black marking is much more limited in extent.

Underside.—Similar to that of *T. eris*, with the three black post-median spots somewhat larger, and the ground-colour inclining to yellow; the secondaries pale yellow, with a post-median row of dark spots from the costal margin to above the sub-median nervure, as in the females of *T. opalescens*. Expanse 2·4 inches. (*Spec. ex. Congo*; *Salvin-Godman Coll.*; *Mus. Brit.*)

FEMALE.—The yellow form is allied to that of *T. eris* (Plate 9, fig. 1d), but has the brownish black marginal borders much reduced, especially on the inner margin, this being faintly shown as in *T. johnstoni* (Plate 8, fig. 1f). There is no dark shading at the base; the secondaries are of the same colour as the primaries, and almost without any markings; the nervules terminating in very faint spots, and the discal band of brown being visible.

Underside.—Similar to that of the male in markings, the ground-colour being entirely sulphur-yellow. Expanse 2·2 inches. (*Spec. ex. Ambroz*; *J. J. Monteiro*; *Mus. Brit.*)

The white form of the female is similar to that of *T. opalescens*, but without the orange internal nervular streak; the apical spots are nearly obsolete in some specimens, but in others they are yellow.

Underside.—Does not differ from the female above described, the general colour inclining more to ochraceous yellow. Expanse 2·3 inches. (*Spec. ex. Ambriz*; *J. J. Monteiro*; *Mus. Brit.*)

HABITAT.—Lower Congo and Angola, to Damara-land.

Angola (*J. J. Monteiro*; *Salvin-Godman*; *Mus. Brit.*). Ambriz (*J. J. Monteiro*; *Mus. Brit.*; *Mus. Salvin-Godman*). Lower Congo (*Coll. Bates*; *Mus. Salvin-Godman*; *Mus. Brit.*). Damara-land (*A. J. Bell*; *C. J. Andersson*; (Cf. Trimen, *l.c.* p. 98).

The range of this species will, I believe, be found to be confined to South-Western Africa, from Damara-land to Angola. There is a specimen in the Salvin-Godman collection received from the Bates collection and said to be from the Lower Congo, but I expect that, as with the specimens of *T. calais*, they really came from Angola, or at least south of the actual Congo River. Specimens in the British Museum said to be from Senegambia appear to me to be in every case true *T. eris* or *T. opalescens*, and I question whether any species of this group occurs within the limits of the true West African forest Sub-region.

Dr. Butler selected the female (Fig. 1f) from "Senegambia" to be figured as representing the "dry-season" form of *T. maimuna*. This specimen is, however, very similar to one of *T. johnstoni*, from Tugela (Guy Marshall), the only difference being that there is no brownish-black border on the inner margin; the black submarginal border near the apex is also wanting in the "Senegambian" specimen. Several specimens of *Teracoli* in the British Museum are labelled "Senegal" from the Druce collection. These I think may be erroneously labelled, as I consider them to be a male and female of *T. opalescens*, two males to be *T. eris*, and the above-mentioned female to be *T. johnstoni*. Further research may, of course, prove that other forms besides *T. calais* inhabit Senegambia, but at present I am inclined to doubt the correctness of this locality for any *Teracolus* except the above-mentioned species. Should *T. opalescens* and *T. johnstoni* really occur in this portion of West Africa, I do not see how the different races can longer be maintained as distinct, and Mr. Guy Marshall and Dr. Trimen will have proved their point that only one species really exists.

EXPLANATION OF THE FIGURES OF *T. maimuna*.

Plate 11, fig. 1. ♂ Ambriz (*J. J. Monteiro*; *Mus. Brit.*).

„ 1a. Underside.

„ 1b. ♀ Ambriz (*J. J. Monteiro*; *Mus. Brit.*).

„ 1c. Underside.

- Plate 11, fig. 1d. ♀ Ambriz (*J. J. Monteiro ; Mus. Brit.*).
 „ 1e. ♂ *T. eris* is true *T. johnstoni*, Nubia (*Mus. Salvin-Godman ; Mus. Brit.*).
 „ 1f. ♀ “Senegambia” (*Mus. Salvin-Godman ; Mus. Brit.*).
 „ 1g. Underside.

TERACOLUS SUBFASCIATUS, Swainson.

(Plate 12, figs. 1, 1a-1e.)

- Teracolus subfasciatus*, Swains. Zool. Illustr. Ins. (2) iii. pl. cxv. (1823); Butler, P. Z. S. 1876, p. 127; Staudinger, Exot. Schmett. i. pl. 23, f. 6 (1884); Trimen, S. Afr. Butt. iii. p. 92 (1889); Butler, P. Z. S. 1896, p. 835; Guy Marshall, P. Z. S. 1897, p. 6; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 393 (1897).
Anthocharis subfasciata, Boisd. Sp. Gen. Lép. i. p. 567, n. 12 (1836); Trimen, Rhop. Afr. Austr. i. p. 58, n. 38 (1862); *id. l.c.* ii. p., 331 (1866).
Ptychopteryx bohemanii, Wallengr. K. Sv. Vet.-Akad. Handl. 1857, n. 4, p. 18; Butler, Lep. Exot. p. 45 (1870).
Thespia bohemanii, Wallengr. Ofvers. K. Vet.-Akad. Förh. 1858, p. 77.
Ptychopteryx iducissa, ♀ (?) Dognin, Le Naturaliste, 1891, p. 132.

MALE.—General colour sulphur-yellow, the primaries having a post-median band of four yellow spots somewhat deeper in colour; a hind-marginal border of dusky brown commencing at the apex and extending to about the first median nervule; the yellow spots enclosed by a broad black bar, terminating somewhat abruptly above the third median nervule; a very minute black spot present at the end of the cell.

The secondaries entirely sulphur-yellow without any markings.

Underside.—Primaries whitish, the apical portion being faint yellow, with wavy lines of lightish brown; secondaries greenish-yellow, but entirely crossed by fine wavy brownish lines, as on the apex of the primaries: a somewhat darker streak is visible from the base to the hind margin. Expanse 2·2 inches. (*Spec. ex. Vaal River ; Mus. Brit.*)

FEMALE.—Ground-colour entirely white, the apical portion being relieved by four spots of reddish-orange; the hind-marginal border, which extends to above the sub-median nervure, and the inner band, being brownish-red. The secondaries similar to the primaries in colour and without markings; the female only differing from the male in the brighter-coloured apical patch.

Underside.—Similar to that of the male, the secondaries being a little darker and the wavy lines rather more strongly pronounced. Expanse 2·3 inches. (*Spec. ex. Kimberley ; Salvin-Godman Coll. ; Mus. Brit.*)

The “dry-season” form of the male has the ground-colour similar to that of the “wet-season” form, but is perhaps a shade darker. The sub-apical row of spots on the primaries is deeper orange-yellow, the black inner bar being a trifle narrower than in the “wet-season” form. The secondaries do not differ in colour from the primaries.

Underside.—Rather more sandy-yellow in colour than the upperside. Expanse 2·4 inches. (*Spec. ex. Nyasa-Land*; *R. Crawshay*; *Mus. Brit.*) The “dry-season” form of the female has the ground-colour entirely white with a very large apical patch of bright orange-red lined on its inner side with pale yellow; the hind-marginal border reddish-brown, extending from the inner margin to the first median nervule, becoming rather darker towards the costa; two faint spots situated between the second and third median nervules, crossing the discal area. The secondaries are entirely white.

Underside.—Primaries white, the apical portion sandy-yellow crossed by the usual fine wavy lines of brown. Secondaries entirely sandy-yellow, the wavy lines traversing the whole of the wing; a dark streak extending through the cell from the base of the wing to the hind-margin, a similar line being also visible along the costa. Expanse 2·5 inches. (*Spec. ex. Nyasa-Land*; *Sir H. H. Johnston*; *Mus. Brit.*)

As Dr. Trimen remarks, the male of this species is wonderfully constant in colouring and marking, but the females vary from white to a yellow colour, similar to that of the male. The apical post-median row of spots on the primaries is of a deep orange-yellow colour in the yellow-tinted females.

HABITAT.—Eastern Cape Colony north to the Transvaal, Matabele-Land, Nyasa-Land, to Uganda, extending also to Damara-Land and South-Western Africa.

EASTERN CAPE COLONY.—Hope Town (*J. H. Bowker*; *Trimen, l.c.*, p. 93).

GRIQUALAND WEST.—Klipdrift (*J. H. Bowker*; *Trimen, l.c.*, p. 93); Kimberley (*Salvin-Godman Coll.*; *Mus. Brit.*).

TRANSVAAL.—Potchefstroom (*W. Morant and T. Ayres*; *Trimen, l.c.*, p. 93). Pretoria (*T. Ayres*; *Trimen, l.c.*, p. 93); Zoutpansberg (*W. L. Distant, Nat. Transvaal*, p. 234, 1892). Limpopo River (*F. C. Selous*; *Trimen, l.c.*, p. 93), Lydenburg District (*T. Ayres*; *Trimen, l.c.*, p. 93).

BECHUANALAND.—Chue Spring (*W. J. Burchell*; *Trimen, l.c.*, p. 93); Motito (*Rer. J. Frédoux*; *Trimen, l.c.*, p. 93); Khama's Country (*Mus. Cecil Barker*).

MATABELELAND.—Makloutse and Tati Rivers (*F. C. Selous*; *Trimen, l.c.*, p. 93); Tati (*F. Oates*; *Westwood in Oates' Matabeleland*, App., p. 336, 1881).

NYASA-LAND.—(*Sir H. H. Johnston*; *Butler, P. Z. S.* 1896, p. 852); Mweni-wandas (*R. Crawshay*; *Butler, P. Z. S.* 1896, p. 835).

ZANZIBAR.—(*Dognin, Le Naturaliste*, 1891, p. 132).

UGANDA.—(*Dr. J. W. Ansorge*; *Guy Marshall, P. Z. S.* 1897, p. 7, note).

SOUTH-WESTERN AFRICA.—Damara-Land (*J. A. Bell*; *Trimen, l.c.*, p. 93).

Dr. Trimen writes as follows: “This very distinct and handsome species was discovered by Burchell in 1812, towards the northern limit of his South African journeyings. Through Professor Westwood's kindness I was able to examine the original specimens, and to refer to Burchell's manuscript list of localities of the species

in his collection. It appeared from the latter that three of the four examples were captured at 'Chue Spring,' and the fourth at 'Little Telip.' Burchell gives the latitude and longitude of the first of these localities, and I am thus able to determine its position on recent maps as about Honing Vley, in British Bechuanaland. Specimens from Motito, in the same tract of country, were sent to me in 1866. Colonel Bowker took a good many specimens on the Vaal River, Griqualand West, and also sent a single example captured at Hope Town, on the left bank of the Orange River. The latter is its most southern locality known to me; and it certainly appears to be most numerous in the tropical portion of its range, Mr. J. A. Bell having brought no fewer than thirty-four specimens in his small collection formed in Damara-land. Colonel Bowker describes the butterfly as a swift flyer; he found it on the wing at Klipdrift (Barkly) in March and April, and took the Hope Town individual on May 1, 1871. Mr. H. L. L. Feltham informs me that he occasionally sees specimens in Kimberley, and took some in the month of December of the years 1884 and 1885. Wallengren records (K. Vet. sv.—Akad Förh; 1875, p. 91) Mr. Person's note that in Southern Transvaal the butterfly occurs in March and April."

It should be noted that, although Dr. Butler considers *T. ducissa* Dognin to be a synonym of the present species, Mr. Guy Marshall believes it to be quite distinct, as will be seen by the following remarks: "Founded on a single specimen from Zanguebar, apparently the only one recorded. Judging by the description, this must be a very distinct species.—Breadth 55 mm. Upperside white; apical third of fore-wings orange-red, bordered exteriorly with brick-brown, the latter colour extending to inner angle. Underside of hind-wings yellowish, with reddish striolæ, and traversed on disc by a straight, well-defined, reddish-yellow ray. The extension of the hind-marginal border in fore-wing is noticeable. The description comes nearer to the 'dry-season' females of *T. phlegyas* (= *buxtoni*), Butl., than anything else, but the complete absence of any black markings along the inner edge of the apical patch would at once distinguish it." (P. Z. S. 1897, p. 21.)

EXPLANATIONS OF THE FIGURES OF *T. subfasciatus*.

- Plate 12, fig. 1. ♂. Vaal River, South Africa (*Mus. Brit.*).
 „ 1a. ♀. Kimberley (*Salvin-Godman Coll.*; *Mus. Brit.*).
 „ 1b. Underside of fig. 1a.
 „ 1c. ♂. Nyasa-Land (*R. Crawshay*; *Mus. Brit.*).
 „ 1d. ♀. Nyasa-Land (*Sir H. H. Johnston*; *Mus. Brit.*).
 „ 1e. Underside of fig. 1d.

TERACOLUS ELGONENSIS, E. M. Sharpe.

(Plate 12, figs. 2, 2a.)

Teracolus elgonensis, E. M. Sharpe, P. Z. S. 1891, p. 191, pl. xvi. fig. 6; Guy Marshall, P. Z. S. 1897, p. 16; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 393 (1897).

MALE.—General colour of the primaries greenish-white, with a small black spot at the end of the discoidal cell; costal margin narrowly edged with black, which is much broader at the apex, and continued along the hind-margin, decreasing in width towards the sub-median nervure, where the black terminates. Near the apex, between the third sub-costal and first radial nervules, is an ovate spot of deep crimson followed by two other spots smaller in size, the last of these being nearly obsolete. At the base near the inner margin is a slight shading of grey. The secondaries are also greenish-white, with no visible markings.

Underside.—Primaries white, with the costal margin, hind-margin, and apical portion yellowish-green, the small black spot at the end of the discoidal cell being visible. Secondaries entirely yellowish-green, the costal margin being narrowly edged with orange, while a small streak of black is strongly pronounced at the end of the cell. From the end of the costa to the sub-median nervure is a discal row of brownish spots situated between the nervules. Expanse 1·9 inch. (*Type in Coll. F. J. Jackson*).

Some specimens collected by Captain Woodward near the Eldoma Ravine are very similar to the type in Mr. Jackson's collection, having the brownish-black apex and hind-marginal border much lighter in colour, the brown border terminating above the first median nervule; the crimson spots on one of these specimens are much diminished in size.

There seems to be a certain amount of variation in the species, as one specimen obtained by Captain Woodward in Nandi has only the faintest indication of a crimson spot near the apex of the primaries, the apical portion of the latter having the hind-margin heavily marked with black. The underside is also rather greener in colour. A fourth specimen is somewhat of a more dead yellowish-white, the apical border being likewise of a lighter brown. The underside is decidedly more pink and altogether realises what one might expect the "dry-season" form of the species to be like. This, however, can scarcely be the case, as Captain Woodward collected all four specimens in the month of March.

HABITAT.—Equatorial Africa, Mount Elgon, Feb. 1890 (*F. J. J.; Jackson Coll.*); Nandi, March 1898 (*Capt. E. M. Woodward*); Eldoma Ravine, March 1898 (*Capt. E. M. Woodward*).

This species is very readily distinguished from all other members of the genus except *T. ennomus*, with which, however, it cannot well be confounded. As Mr. Guy

Marshall remarks: "A most interesting and distinct little species, allied to *T. eunomus*, Hopff., but readily distinguished by its much smaller size, its greenish-white ground-colour, and by the very different position of the three small crimson spots near the apex. I have seen the unique type, a male, which is in the collection of Mr. F. J. Jackson, who captured it on Mount Elgon, to the north of Victoria Nyanza."

EXPLANATION OF THE FIGURES OF *T. elgonensis*.

Plate 12, fig. 2. ♂. Mount Elgon (*F. J. Jackson*; type).

„ 2a. Underside of fig. 2.

TERACOLUS EUNOMUS, Hopffer.

(Plate 13, figs. 1, 1a.)

Pieris eunoma, Hopffer, Ber. Verh. Akad. Berlin, 1855, p. 640; id. in Peters, Reise Mossamb. Zool v. p. 353, taf. xxiii. figs. 1, 2 (1862).

Teracolus eunoma, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 802 (1877); Trimen, S. Afr. Butt. iii. p. 114 (1889); Guy Marshall, P. Z. S. 1897, p. 15; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 393 (1897).

Apparently nearly allied to *T. elgonensis*, but larger and whiter, with none of the greenish tint of that species, the crimson-lake spots being distinctly larger in size. The underside of the secondaries is entirely yellow, not greenish as in *T. elgonensis*.

HABITAT.—Inhambane, Mozambique (*Dr. W. Peters*).

I am unable to speak from personal examination of the distinctness of this species, which was discovered by Dr. W. Peters during his celebrated expedition to Mozambique. The type still remains unique in the Berlin Museum. The differences between *T. eunomus* and *T. chromiferus* are very slight, but they are apparently constant. Mr. Guy Marshall has united *T. chromiferus* and *T. eunomus* together, and Dr. Trimen considers that they must be identical, for he gives a description of *T. eunomus* from Hopffer's figure, and refers a specimen from Zanzibar in the Hewitson collection in the British Museum, to the latter species. Dr. Butler, however, keeps the two distinct, and I am inclined to agree with him, as, to judge by Hopffer's figures, *T. eunomus* must be smaller than *T. chromiferus*, and have the crimson-lake markings on the primaries much more restricted. The only specimen that I have seen from Mozambique is one obtained there by Dr. Anson, and this was certainly *T. chromiferus*. It is therefore possible that the latter may only be a seasonal form of *T. eunomus*.

EXPLANATION OF THE FIGURES OF *T. eunomus*.

Plate 13, fig. 1. ♂. Inhambane.

„ 1a. Underside of fig. 1.

(Copied from Hopffer's plate [*l.c.*])

TERACOLUS CHROMIFERUS, Rothschild.

(Plate 13, figs. 2, 2a-2d.)

Teracolus chromiferus, Rothschild, Novit. Zool. i. p. 533 (1894); Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 394 (1897).

Teracolus eunomus, (pt.) Guy Marshall, P. Z. S. 1897, p. 16.

This species is similar to *T. eunomus*, but is at once distinguished by the larger and more pronounced spots of crimson-lake on the fore-wing.

MALE.—Primaries white, the apical portion relieved by four ovate spots of crimson-lake, varying in size; costal margin, apex, and hind-margin, brownish-black, the borders of the latter much broader than in *T. eunomus*, the border becoming gradually more narrow and terminating at the second sub-median nervule; the crimson spots separated by the black nervules, the veins crossing the discal area being likewise black; a black spot also distinctly visible at the end of the discoidal cell. The secondaries entirely white without any visible markings, the base of the wings slightly dusted with grey.

Underside.—Central area of the primaries white; apical area, costal and hind margins deep chrome-yellow, this colour extending as far as the second sub-median nervule, the black discoidal spot being very distinct. Secondaries entirely deep chrome-yellow with a brilliant orange streak at the base of the costal margin, in the middle of which is a black spot; a discal row of more or less obsolete dark spots, the spot at the end of the anal angle being larger than the others, one of which is situated at the end of the cell. Expanse 2.5 inches. (*Spec. ex. Chinde; type, Mus. Rothschild.*)

FEMALE.—General colour white. Primaries with the hind-marginal border brown, the latter toothed internally and widening towards the apex, the apical portion having two nearly obsolete spots of crimson; a discal row of black spots crossing the wing from the costa to above the sub-median nervure, each spot situated between a nervule. Base of wing grey with a well-defined black spot at the end of the cell. Secondaries creamy-white, the nervules terminating, on their marginal border, in large black spots; a minute spot of black present at the end of the discoidal cell, the base of the wing being grey.

Underside.—Central area of the primaries white; apex deep chrome-yellow, the discal row of black spots, as well as the discoidal spot, being strongly indicated; the base of the wing shaded with grey. Secondaries entirely deep chrome-yellow, the costal margin streaked with orange-chrome, the black discal spots very distinct, but the nervular row of dark spots on the hind-margin only faintly indicated. Expanse, 2.6 inches. (*Spec. ex. Zanzibar; Salvin-Godman Coll.; Mus. Brit.*)

HABITAT.—SOUTH-EASTERN AFRICA : Beira (*Guy Marshall*), Chinde, Zambesi River (*Type* ; *Mus. Rothschild*), Mozambique (*Dr. J. W. Ansorge* ; *Mus. Rothschild*).

EAST AFRICA.—Zanzibar (*Salvin-Godman Coll.* ; *Mus. Brit.*) ; Dara-Salaam (*Coll. P. Crowley*).

This species was described by Mr. Rothschild from a specimen caught at Chinde on the Zambesi River : it is considered by Dr. Butler to be the "wet-season" form of the species. There is also in Mr. Rothschild's collection a smaller specimen, taken by Dr. J. W. Ansorge somewhere in Mozambique, which has the crimson spots on the apex of the primaries much more restricted, and is identical with a specimen in the Hewitson collection in the British Museum labelled as from Zanzibar. Mr. Guy Marshall (*P. Z. S.* 1897, p. 17) states that he caught four specimens near Beira in January 1896. He has given a description of one of the females obtained on this occasion. He also states that three specimens were obtained by Dr. Ansorge in German East Africa, and he mentions a female example in my collection ; the latter, however, I refer to *T. puniceus* (*vide infra*). I have not been able to find any examples of this species in the Ansorge collection in the Tring Museum.

EXPLANATION OF THE FIGURES OF *T. chromiferus*.

- Plate 13, fig. 2. ♂. Zanzibar (*Salvin-Godman Coll.* ; *Mus. Brit.*).
 „ 2a. Underside of fig. 2.
 „ 2b. ♀. Zanzibar (*Salvin-Godman Coll.* ; *Mus. Brit.*).
 „ 2c. Underside of fig. 2b.
 „ 2d. Mozambique (*Dr. J. W. Ansorge* ; *Mus. Rothschild*).

TERACOLUS PUNICEUS, Butler.

(Plate 14, figs. 1, 1a-1g.)

Teracolus puniceus, Butler, *P. Z. S.* 1888, p. 72 ; id. *P. Z. S.* 1894, p. 573, pl. xxxvi. figs. 5, 6 ; id. *Ann. and Mag. Nat. Hist.* (6) xx. p. 394 (1897) ; E. M. Sharpe, in *Neumann's Elephant Hunting in E. Africa*, App., p. 445 (1897) ; Butler, *P. Z. S.* 1898, p. 408.
Teracolus hetara, (pt.) E. M. Sharpe, *P. Z. S.* 1894, p. 348 ; Guy Marshall, (pt.) *P. Z. S.* 1897, p. 17.

Similar to *T. chromiferus*, but with the crimson-lake patch on the primaries larger, and with the neuration of both wings emphasised in lines of black.

MALE.—Primaries white as in *T. chromiferus*, but the veins more distinctly indicated by black lines ; the costa and hind-margin brownish-black, reaching as far as the second median nervule ; the crimson-lake patch on the apical area very broad and having an additional fifth spot between the third median and first discoidal nervules ; the basal area dusted with grey, extending along the inner margin.

Secondaries white, the black veins plainly indicated, the first, second and third discoidal nervules terminating in minute black spots on the hind-margin.

Underside.—Differs from that of *T. chromiferus* in the nearly obsolete yellow apex of the primaries; the venuration of both wings decidedly pronounced; the secondaries of the palest yellow, but with the inner margin slightly darker; the costal margin with a faint basal streak of orange, but more restricted than in the foregoing species; the dark transverse band on the secondaries only faintly visible. Expanse 2.55 inches. (*Spec. ex. Teita; Coll. F. J. Jackson.*)

FEMALE.—Distinguished from the female of *T. chromiferus* by the much broader brownish-black apical patch and the broader hind-margin on the primaries; the apical area showing a post-median row of five hastate spots. Of these five spots, the three median ones are crimson and the anterior and posterior ones are white. Between the first and second median nervules occurs a black spot, and a similar one is situated between the first median nervule and the sub-median nervule. The black spot at the end of the discoidal cell is smaller than in *T. chromiferus*.

Secondaries.—White, the nervules terminating in large brownish-black spots, the same colour radiating along the veins so as to make the border appear strongly dentated on its inner aspect. The base of both the primaries and secondaries is clearly dusted with grey.

Underside.—Primaries similar to those of *T. chromiferus*, but with the apical area and hind-margin of a somewhat deeper yellow shade. Secondaries entirely ochraceous yellow, the marginal border violaceous-brown, with a transverse band of the same colour. There are also faint wavy specklings of brown over the hind-wing, especially near the base. Expanse 2.55 inches. (*Spec. ex. Teita; Coll. F. J. Jackson.*)

The male and female above described represent the "wet-season" form of *T. puniceus* as determined by Dr. Butler. The male was procured by Mr. Jackson on the march from the coast to Teita in December 1891. In the same month and in the same district, Mr. Jackson also obtained a male answering to what Dr. Butler considers to be the "dry-season" form, on which he founded the species. It is, as he justly observes, smaller than the "wet-season" form, and has the black veining much less distinctly indicated. The underside of this "dry-season" specimen has the secondaries entirely sandy-pink with a transverse band of brownish spots across half the wing. The primaries are white below, with the apical area indicated by a patch of sandy-pink. Expanse 2.2 inches. (*Spec. ex. Teita; Coll. F. J. Jackson.*)

As with the males, we find the females of the "dry-season" form very much smaller than those of the "wet-season" form. A female from the Second Kedong River,

November 1896 (*Mus. Rothschild*), obtained by Dr. Ansorge, differs from that of the "wet-season" phase in having the brownish-black apical area and hind-marginal border on the primaries much more reduced in extent, the sub-terminal row of ovate crimson spots not so strongly indicated, the third spot being only faintly tinged with that colour. The post-median row of black spots does not form a distinct band as in the "wet-season" form, but is arrested about the third median nervule and barely encloses the crimson spots. The secondaries are entirely white, with two minute dark spots situated at the end of the first and second radial nervules on the hind-marginal border.

Underside.—General aspect whiter than in the "wet-season" phase, the post-median row of black spots on the primaries much reduced in size, with some faint sprinklings of brown on the apical portion. The secondaries white, with obsolete vermiculations of brown, the usual dark transverse band being distinctly visible. Expanse 1·8 inch. (*Spec. ex. Second Kedong River; Mus. Rothschild.*)

A second form of the "dry-season" phase differs only in the general colour being sulphur-yellow, the dark markings rather more pronounced, especially on the hind-margin of the secondaries.

Underside.—Central area sulphur-yellow; the hind-margin and apical portion ochraceous; the post-median row of spots larger and browner. Secondaries entirely ochraceous with thin wavy lines of brown over the entire surface; the brown transverse band more heavily marked than in the female previously described. Expanse 2·1 inches. (*Spec. ex. Kikuyu; Coll. F. J. Jackson.*)

The "wet-season" females vary considerably, one specimen resembling the female described, with the exception that the ovate spots on the primaries are only slightly tinged with crimson; the underside is of a paler yellow. Expanse 2·4 inches. (*Spec. ex. Kibwezi; Coll. F. J. Jackson.*)

A second variation which I have figured is distinguished by the entire absence of the crimson-lake on the primaries, the apical and marginal borders being much blacker and broader: a white spot is visible near the posterior angle. The black nervular spots on the hind-margin of the secondaries are rather more strongly indicated.

Underside.—Central area of the primaries white, the apical portion fulvous-brown, with black spots visible at the ends of the sub-median nervule and of the first and second median nervules on the hind-margin; the post-median row of black spots larger and more heavily marked. Secondaries fulvous-brown, with darker wavy lines, and with the hind-marginal border shaded with violaceous; the transverse band of brown also well marked. Expanse 2·3 inches. (*Spec. ex. Teita; Coll. F. J. Jackson.*)

Three other specimens from Usagara and Teita agree with the female above described, but they have the marginal borders much narrower and more of a brownish-black. The undersides are paler, but the specimens are undoubtedly somewhat worn. Expanse 2·4 inches.

HABITAT.—EASTERN AFRICA. Usagara (*Dr. Baxter ; Coll. E. M. Sharpe*). Sabaki Valley (*Dr. J. W. Gregory ; Mus. Brit.*; Butler, P. Z. S. 1894, p. 573, pl. xxxvi. figs. 5, 6). Mombasa (*Salvin-Godman Coll. ; Mus. Brit.*). Between Mombasa and Teita (*F. J. J. ; Jackson Coll.*). Ndi, Teita, 2400 feet (*Slingsby Godfrey ; Mus. Brit.*). Ndi, Mareh (*Dr. J. W. Ansorge ; Mus. Rothschild*). Kibwezi, December (*F. J. J. ; Jackson Coll.*). Maragoyakanga, December (*Capt. Pringle ; Coll. E. M. Sharpe*). Ndara Hill, February (*Capt. Pringle ; E. M. Sharpe, P. Z. S. 1894, p. 348, s.n. T. hetæra*). Maungu Hill, December (*Capt. Pringle ; E. M. Sharpe, l.c.*). Taveta, July (*Mus. Rothschild*). Taru, December (*C. S. Betton ; Butler, P. Z. S. 1898, p. 408*). Kikuyu, September (*F. J. J. ; Jackson Coll.*). Turquel, December (*F. J. J. ; Jackson Coll.*). Second Kedong River, November (*Dr. J. W. Ansorge ; Mus. Rothschild*). Kilungu, April (*Dr. J. W. Ansorge ; Mus. Rothschild*). Kampi Mbaruk, November (*Dr. J. W. Ansorge ; Mus. Rothschild*). Victoria Nyanza (*Bishop Hannington ; Mus. Brit.*). Butler, P. Z. S. 1894, p. 573). Wadelai (*Emin Pasha ; Mus. Brit.*; Butler, P. Z. S. 1888, p. 72).

T. puniceus is very closely allied to the next species, *T. hetæra*, and, in my opinion, the two species are very doubtfully distinct. I follow Dr. Butler in keeping them separate, and have accordingly figured specimens of both forms as determined by him in the British Museum. Dr. Butler remarks as follows: "The 'wet-season' form of this species has recently been received from Ndi, near Mombasa; it is slightly larger than the typical 'dry-season' form, and the magenta-red extends a little further along the costa, but not upon the outer margin; the veins above are more heavily blackened and terminate in black marginal dots; on the under surface the apex of primaries and the whole of secondaries are creamy-buff, the costa of secondaries narrowly saffron-yellow towards the base, and the transverse ray is either absent or represented by black-brown dashes. The female is either white or bright yellow above, and greyish-lavender or yellow, sparsely irrorated with greyish below; the markings are somewhat similar to those of *T. hetæra*, but the borders are perhaps rather less heavy, more nearly resembling the 'dry-season' females of that species. *T. puniceus* ranges from Wadelai through the Victoria Nyanza south-eastwards to Mombasa."

Mr. Guy Marshall has no doubt that *T. puniceus* is the "dry-season" form of *T. hetæra*. He observes: "The size of the apical patch and the black markings of the upper side being somewhat more reduced, the underside of the secondaries has a pinkish tinge with faint grey 'hatchings,' and a distinct discal ray from the costa."

Judging from the series which I have examined in the British Museum, and in the collections of the Hon. Walter Rothschild and Mr. F. J. Jackson, the range of the species appears to be from Usagara to Wadelai. It seems to be generally distributed in British East Africa, the specimens procured in the month of November being of the "dry-season" form, and those obtained from December to April belonging to the "wet-season" form.

EXPLANATION OF THE FIGURES OF *T. puniceus*.

- Plate 14, fig. 1. ♂. Coast to Teita (*F. J. J. ; Jackson Coll.*).
 „ 1a. ♀. Coast to Teita (*F. J. J. ; Jackson Coll.*).
 „ 1b. ♀. Underside.
 „ 1c. ♀. Coast to Teita (*F. J. J. ; Jackson Coll.*).
 „ 1d. ♂. Coast to Teita (*F. J. J. ; Jackson Coll.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀. Kikuyu (*F. J. J. ; Jackson Coll.*).
 „ 1g. ♀. Second Kedong (*Dr. Ansorge ; Rothschild Coll.*).

TERACOLUS HETÆRA, Gerst.

(Plate 15, figs. 1, 1a-1e.)

Callosune hetæra, Gerstaecker, Arch. f. Naturg. 1871, p. 357 (♂); *id.* in Von der Decken's Reis. Ost-Afr. iii. Abth. 2, p. 365, pl. xv. fig. 2 (1873); Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 804 (1877).

Teracolus foliaceus, Butler, P. Z. S. 1894, p. 573, pl. xxxvi. fig. 7 (♀).

Teracolus hetæra, Trimen, S. Afr. Butt. iii. p. 84 (1889); E. M. Sharpe, P. Z. S. 1894, p. 348; Guy Marshall, P. Z. S. 1897, p. 17; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 394 (1897); *id.* P. Z. S. 1898, p. 408.

MALE.—Very similar to the "wet-season" form of *T. puniceus*, but differing in having six ovate apical spots of crimson-lake on the primaries; the veins on the secondaries terminating in very distinct black spots, and with the dark transverse band on the underside distinctly indicated; the basal area of both wings only slightly shaded with grey.

Underside.—Primaries creamy-white, a post-median row of brownish-black spots crossing the wing, the spots on the apical area being larger and more pronounced, the sub-median nervure and the first and second median nervules ending in slightly indicated blackish spots on the hind-margin. Secondaries pale yellow, the dark transverse band being very much more pronounced than in *T. puniceus*, this band complete to as far as the second median nervule; a nearly obsolete spot visible between the latter and the first median nervule, with a larger spot situated just above the sub-median nervure. Expanse 2.8 inches. (*Spec. ex. Taru ; C. S. Betton ; Mus. Brit.*)

FEMALE.—General colour pinkish-white with very broad apical and hind-marginal borders of black, not dentated on the inner aspect, this black apical border relieved by a post-median row of six ovate spots of white sprinkled with crimson, the second, third and fourth being the largest, the first, fifth and sixth being nearly obsolete; near the posterior angle the usual white spot well defined, and the basal area grey. Secondaries pinkish-white, the black border heavily marked, while a blackish line corresponding to the transverse band of the underside is strongly indicated.

Underside.—Central area of the primaries pinkish-white, the post-median row of black spots, as well as the spots at the end of the sub-median nervure and the first median nervule being strongly marked; the apical area and hind-margin to as far as the second median nervule reddish-buff, with very fine vermiculations of brown. Secondaries entirely reddish-buff, lighter in colour towards the base, the ground colour plentifully sprinkled with brown wavy lines, while a violaceous shading is visible near the hind-margin; the transverse band and hind-marginal border dark brown. Expanse 2·5 inches. (*Spec. ex. Sabaki Valley; Dr. J. W. Gregory; Mus. Brit.; type of T. foliaceus, Butler.*)

Another form of this "wet-season" female differs only in its sulphur-yellow ground-colour, the apical and posterior spots being of the latter colour. The underside is rather more reddish in colour, but otherwise does not differ as regards the markings. Expanse 2·5 inches. (*Spec. ex. Rabai Hills; Jackson Coll.*)

"DRY-SEASON" FORM OF THE MALE.—Differs in having the dark lines of the veins on both wings less pronounced, the black discoidal spot on the primaries being smaller. Secondaries with the black nervular spots on the hind-margin nearly or quite obsolete.

Underside.—The apical area of the primaries and the ground-colour of the secondaries pale sandy-pink, while, with the exception of the very faint transverse line on the latter, there are no other visible markings. Expanse 2·8 inches. (*Spec. ex. Mombasa; Salvin-Godman Coll.; Mus. Brit.*).

"DRY-SEASON" FORM OF THE FEMALE.—Central area of the primaries creamy-white, the black marginal border narrower, especially towards the posterior angle, and not dentated on the inner edge; only two white spots with just a suggestion of crimson visible, the others being nearly obsolete. Secondaries scarcely differing from those of *T. puniceus*, the grey at the base of both wings being more strongly marked.

Underside.—Altogether brighter fulvous, the apex and hind-margin on the primaries being more reddish-buff as far as the first median nervule; the other markings similar to those of the females of the "wet-season" phase. Secondaries with a violaceous shading on the hind-margin, the extreme edge being outlined with reddish-

buff, the transverse band dark brown, with a whitish spot at the end of the cell encircled with orange, of the same tint as the costal margin. Expanse 2·9 inches. (*Spec. ex. Mombasa; Salvin-Godman Coll.; Mus. Brit.*)

HABITAT.—EASTERN AFRICA. Mombasa (*Salvin-Godman Coll.; Mus. Brit.*). Lamu (*Slingsby Godfrey; Mus. Rothschild*). Melindi (*Mus. Rothschild*). Tana River (*Slingsby Godfrey; Mus. Rothschild*). Sabaki Valley (*Dr. J. W. Gregory; Mus. Brit.; type of T. foliaceus, Butler, P. Z. S. 1894, p. 573, pl. xxxvi. fig. 7*). Taru, December (*C. S. Betton; Mus. Brit.; Butler, P. Z. S. 1898, p. 408*). Kibwezi, December (*F. J. J.; Jackson Coll.*). Coast to Teita, December (*F. J. J.; Jackson Coll.*). Maungu Hill, December (*Capt. Pringle; E. M. Sharpe, P. Z. S. 1894, p. 348*). Ndara, December (*Gerst. in Von der Deckens' Reis. Ost-Afr. iii. pt. 2, p. 365, pl. xv. fig. 2, 1873*). Rabai Hills, July (*F. J. J.; Jackson Coll.*).

Originally described by Dr. Gerstaecker from Ndara, this species appears to be entirely confined to East Africa, and, in fact, occupies nearly the same area as *T. puniceus*. It has been sent in some numbers from the Teita District, but has not as yet been found so far in the interior as *T. puniceus*. As to the supposed occurrence of the species in Somali-land, I have explained below how I came to make this mistake.

The females of the present species appear to vary considerably, especially in the so-called "wet-season" phase, and this variation reaches its extreme in the white-and-black form called *T. foliaceus* by Dr. Butler, which was first united to *T. hetæra* by Mr. Guy Marshall, and is now admitted to be identical by Dr. Butler himself. Although I have treated *T. hetæra* and *T. puniceus* as distinct species, following the arrangement in the British Museum, I am inclined to believe, with Mr. Guy Marshall, that the two are really not to be separated.

The chief difference between them is that *T. hetæra* has six ovate crimson spots on the apical portion of the primaries instead of five, as in *T. puniceus*. The sixth spot, however, is often so small as to be practically obsolete, so that this character seems not to be constant. In the female of *T. hetæra* the inner edge of the hind-marginal border on the primaries is not dentated, but has the outline indicated in a curved line. There is, however, one specimen from Taru in the British Museum, which is there referred to *T. hetæra*, and which shows slight indentations, so that this character also appears to be inconstant.

The males of *T. hetæra* show a post-median row of spots on the underside of the primaries, and on the secondaries the transverse band is more strongly pronounced than in *T. puniceus*. These characters are greatly in evidence in the females of both species. So far, I have not seen any indications of the apical spots on the primaries

of the males of *T. puniceus*, and this is the principal claim for the separation of that species from *T. hetæra*. Mr. Guy Marshall writes: "I cannot distinguish the single female on which Mr. Butler founded his *T. foliaceus* from the female of *T. hetæra*, of which I have seen a long series. As usual, the colouring of the female is highly variable, ranging from dull white, through opalescent or yellowish white to bright yellow; the black borders are very heavy and radiate somewhat on the nervules in the hind wings; there is no black bar on the inner margin of the fore wings, but strong basal grey clouding; the spots in the apical area are black and small, white or yellowish in colour, and usually are more or less suffused with crimson scales. At present *T. hetæra* has been recorded from the Sabaki River and Victoria Nyanza on the south, northward to Wadelai."

EXPLANATION OF THE FIGURES OF *T. hetæra*.

- Plate 15, fig. 1. ♂. Taru (*C. S. Betton*; *Mus. Brit.*).
 „ 1a. Underside.
 „ 1b. ♀. Rabai Hills (*F. J. J.*; *Mus. Jackson*).
 „ 1c. Underside.
 „ 1d. ♀. Sabaki Valley (*Dr. J. W. Gregory*; *Mus. Brit.*).
 „ 1e. ♂. Mombasa (*Salvin-Godman Coll.*; *Mus. Brit.*).
 „ 1f. Underside.
 „ 1g. ♀. Mombasa (*Salvin-Godman Coll.*; *Mus. Brit.*).
 „ 1h. Underside.

TERACOLUS LORTI, E. M. Sharpe.

(Plate 16, figs. 1, 1a-1e.)

Teracolus lorti, E. M. Sharpe, P. Z. S. 1896, p. 527; Guy Marshall, P. Z. S. 1897, p. 18; Butler, Ann. and Mag. Nat. Hist. (6) xx., p. 395 (1897).

Teracolus hetæra (nec Gerst), E. M. Sharpe, P. Z. S. 1896, p. 527.

Teracolus ludovicæ, E. M. Sharpe, MSS. Butler, P. Z. S. 1897, p. 693 (nom. nudum).

MALE.—Similar to *T. hetæra*, but smaller, and with the apical patch very much larger, and of a magenta tint rather than crimson; costa and basal area of primaries dusted with grey; the hind marginal border brownish-black, the veins strongly enforced by black lines. The magenta patch near the apex commences just above the discoidal cell and extends as far as the second median nervule. Secondaries rather more grey at the base, the veins black, but fading in intensity towards the hind margin and not showing the black terminal spots at the end of the nervules as in *T. hetæra*.

Underside.—Central area of the primaries white with the apical portion sandy-

pink. Secondaries sandy-pink dusted with brown at the base. The usual dark spot at the end of the discoidal cell is united by a thin dark line to another spot situated nearer to the hind margin. Expanse 2·3 inches. (*Spec. typ. ex Dara-as, Goolis Mts. Somali Land.*)

FEMALE.—Primaries white, the apex and hind margin blackish-brown, the crimson hastate spots on the apical area divided into two rows by a discal band of black spots from the costal margin to above the sub-median nervure; a black spot strongly visible at the end of the discoidal cell; base of wing dusted with grey. Secondaries white, each of the nervules terminating in black spots as far as the second median nervule; base of the wing greyish.

Underside.—Central area white, the apical portion sandy-buff; the black discal band from the costal to the sub-median nervure very strongly pronounced. Secondaries entirely sandy-pink, a band of brown traversing the discal area, but becoming nearly obsolete after the third median nervule. Expanse 2·1 inches. (*Spec. typ. ex Darra-Surree, Somali Land.*)

In Mrs. Lort Phillips's collection there is a second form of the female, differing in having the hastate spots of the apical area entirely white and only slightly sprinkled with the crimson colour which is so strongly pronounced in the female above described. On the *underside*, the apex of the primaries and the whole of the secondaries are deep sandy-buff; in other respects it does not differ from the female described above. Expanse 2 inches. (*Spec. typ. ex Darra-Surree, Somali Land.*) As in *T. hetæra*, the females seem to have two forms, one with red, the other with white, markings in the apical area of the primaries. A distinguishing character of the female of *T. lortii* is that the red or white patch on the apical area is divided by a well indicated post-median line of black spots.

HABITAT.—Somali Land. Goolis Mountains (*Mrs. L. Lort Phillips*). Jifa Medir (*R. M. Hawker*). Arusa Galla Country (*F. Gillett; Mus. Brit.*).

This species was first obtained by Mrs. Lort Phillips in the Goolis Mountains in 1895. She met with it at Dara-as on the 5th of March, and at Darra Surree on the 10th of the same month. I have also seen two male specimens in Mr. R. M. Hawker's collection, caught by him at Jifa Medir. The range of the species extends to Western Somali Land, as Mr. F. Gillett obtained a specimen near Sheik Husein in the Arusa Galla country at the end of September 1894. Mrs. Lort Phillips tells me that on her second visit to the Goolis Mountains only one specimen of *T. lortii* was seen during the expedition. The individual in question flew at a rapid pace and quickly disappeared over the mountain side. I do not wonder that Mr. Guy Marshall (*P.Z.S.* 1897, p. 18) has expressed his surprise that *T. hetæra* should be found along with *T. lortii* in Somali Land. I am afraid that I am responsible for this error, for

I at first determined Mrs. Lort Phillips's specimens as *T. hetæra*, and when I came to the conclusion that the species was new and called it *T. lorti*, I omitted to take out the MSS. referring to *T. hetæra* from my paper: hence the mistake.

EXPLANATION OF THE FIGURES OF *T. lorti*.

- Plate 16, fig. 1. ♂. Dara-as, Goolis Mts. (*Mus. L. Lort Phillips*).
 „ 1a. Underside.
 „ 1b. ♀. Darra-Surree (*Mus. L. Lort Phillips*).
 „ 1c. Underside.
 „ 1d. ♀. Darra-Surree (*Mus. L. Lort Phillips*).
 „ 1e. Underside.

TERACOLUS REGINA (Trimen).

(Plate 17, figs. 1, 1a-1h.)

- Anthopsyche ione*, Wallengr. (nec Godart), K. Sv. Vet. Akad. Handl.; Lepid. Rhop. Caffr., p. 15 (1857).
Anthocaris regina, Trimen, Trans. Ent. Soc. Lond. (3) i. p. 520 (1863).
Callosune regina, Kirby, Syn. Cat. Diurn. Lepid. p. 500 (1871); Gerstaecker, in Von Der Decken's Reis. iii. Abth. ii. p. 366 (1873); Westwood in Oates's Matabele Land, App. p. 339, pl. E. figs. 9, 10 (1881).
Teracolus regina, Trimen, S. Afr. Butterflies, iii. p. 111, pl. xi. fig. 3 (1889); *id.* P. Z. S. 1891, p. 97; Butler, P. Z. S. 1896, p. 836; Guy Marshall, P. Z. S. 1897, p. 21; Butler, Ann. & Mag. Nat. Hist. (6) xx. p. 395 (1897).
Callosune anax, Grose Smith, Ann. & Mag. Nat. Hist. (6) iii. p. 125 (1889); *id.* Rhop. Exot. I. *Callosune* pl. 1, figs. 5-8 (1889).
Teracolus anax, Butler, Ann. & Mag. Nat. Hist. (6) vii. p. 47 (1891); *id.* P. Z. S. 1893, p. 664; Trimen, P. Z. S. 1894, p. 66; Butler, P. Z. S. 1896, p. 126; *id.* P. Z. S. 1896, p. 852.
Teracolus eliza, E. M. Sharpe, Ann. & Mag. Nat. Hist. (6) v. p. 441 (1890); Waterhouse, Aid Ident. Ins. pl. 189, figs. 5, 6 (1890).

MALE.—Primaries with the central area white, the apical portion with a large iridescent purplish patch; this patch enclosed by a black border, commencing from about the middle of the costa and extending to the hind margin, the latter and the apex being also black; the black border nearly obsolete at the posterior angle; the black radiating along the nervules towards the discoidal cell, and so dividing the purple area into spots which vary in size; a distinct grey shading visible on the black border at the apex. Secondaries entirely white, the nervules black, terminating on the hind marginal border in black spots. A shading of grey at the base of both wings.

Underside.—Primaries white, the apical area pale yellow, with some small black nervular spots on the hind margin, followed by a post-median apical row of five

black spots; a similar black spot also visible at the end of the cell. Secondaries white, with the usual orange costal streak, and a similar streak along the sub-median nervure, also above the black discoidal spot at the end of the cell; the nervules terminating in black spots on the hind margin but varying in size; a faint indication of a transverse band crossing the discal area, consisting of large black spots, one at the end of the costal nervure, the second on the sub-median nervure, three minute spots being situated between the first radial and the first, second and third median nervules. Expanse 2.4 inches. (*Spec. ex Nyasa Land; H. H. Johnston; Mus. Brit.*)

FEMALE.—(Fig. 1a). Primaries white, shaded with grey near the base, the purple of the apical area not forming a large patch as in the male, but broken up into spots and separated by the interposition of a well marked sub-apical band of black, which extends down to the first median nervule. Two distinct black spots are indicated on the white portion of the wing, one discoidal, and the other nearer the anal angle, above the sub-median nervure.

Secondaries white, sprinkled with grey over the basal area, and having a broad row of large black spots, each of which is situated at the end of a nervule, thus forming a disconnected broad border round the hind margin of the wing. The transverse row of dark spots on the underside is faintly visible on the upper surface.

In both primaries and secondaries the black nervules are obsolete and not distinct as they are in the male.

Underside.—Central area of the primaries white, the apex and hind margin being pale yellow, with a strongly marked post-median row of black spots corresponding with the band which crosses the apical area above, and from which equally distinct black lines radiate along the nervules to the hind margin of the wing. Secondaries entirely pale yellow, the nervules picked out with black towards the hind margin, which is dusky; a transverse band of seven black spots, situated between the nervules and completely traversing the discal area to the inner margin; the characteristic basal streak of orange present on the costal margin, and a small spot of dusky orange colour situated above a tiny black discoidal spot. Expanse 2.3 inches. (*Spec. ex Makaya District; F. Kirby; Mus. Brit.*)

A second form of the female (fig. 1d) has the general colour of the wings yellow instead of white; on the apical portion of the primaries the first row of spots is yellow, while the second and inner row consists of but two small purple spots as in the typical female. Secondaries with a broader and more complete black hind-marginal border, not broken up into spots as in the female above described.

Underside.—The general colour of the primaries is yellow, with the apical area

darker, the black markings being similar to those of the typical female. Secondaries entirely deep chrome-yellow and showing an additional bright orange streak along the sub-median nervure: the other dark markings do not differ from those of the ordinary type. Expanse 2·3 inches. (*Spec. ex Shirè River; Salvin-Godman Coll.; Mus. Brit.*)

A third form of the female is similar to the one above described, but is white suffused with yellow; the sub-apical row of yellow spots on the primaries is sprinkled with red, while there are three purple spots representing the lower row of markings.

Underside.—Central area of primaries white, the base, apex and hind-margin greenish yellow, all the black markings well pronounced. Secondaries with the discal area and hind margin pale yellow, the costal margin, basal area, discoidal cell and sub-median nervure strongly suffused with streaks of bright orange. Expanse 2·4 inches. (*Spec. ex Henga, 3230 feet, January 22, 1895; R. Crawshay; Mus. Brit.*)

DRY-SEASON FORM OF MALE.—White with no grey shading near the base, and differing in having the black border, which encloses the iridescent purple patch on the primaries much narrower, the apical margin suffused with grey. Secondaries without any nervular lines or terminal spots.

Underside.—Central area white, apex pinkish-buff, the black discoidal spot very minute. Secondaries entirely pinkish-buff, with the costal orange streak paler; the costal margin and the basal area waved with fine vermiculations of dusky brown which extend along the sub-median nervure to the anal angle; the usual dusky transverse discal band nearly obsolete. Expanse 2·7 inches. (*Spec. ex Loangwa Valley Pass, Nyasa Land, 4090 feet, August 28, 1895; R. Crawshay; Mus. Brit.*)

DRY-SEASON FORM OF FEMALE.—Agrees with the "wet-season" female in colour and markings, but the black on the apical area and hind margin of the primaries is more restricted, and shows a distinct grey shading at the extreme edge as in the male; the sub-apical row of spots on the apex is white sprinkled with crimson, the three lower spots bright crimson. Secondaries have the black nervular spots on the hind margin nearly obsolete and the grey shading at the base only faintly indicated.

Underside.—Primaries white, the apex sandy colour darkly speckled, the post-median band of black spots somewhat smaller, those situated above the sub-median nervure and first median nervule nearly obsolete. Secondaries entirely sandy colour, dusted all over with greyish brown, the transverse band, composed of brownish spots, not pronounced as in the "wet-season" forms; the orange costal streak also paler in colour. Expanse 2·2 inches. (*Spec. ex Makaya District, November 1896; F. Kirby; Mus. Brit.*)

HABITAT.—SOUTH WEST AFRICA. DAMARA LAND.—Botletle River, Lake N'gami (*J. A. Bell*; *Trimen*, S. Afr. Butterfl. III. p. 113 (1889); Humbe, Cunene River, October (*A. Erikson*; *Trimen*, P. Z. S. 1891, p. 97).

SOUTH EAST AFRICA.—TRANSVAAL. Mountains of Lydenburg District (*T. Ayres*; *Trimen*, *l.c.* p. 113, 1889). Junction of Marico and Limpopo Rivers (*F. C. Selous*, *A. Erikson*; *Trimen*, *l.c.* p. 113). ZULU LAND (*Mus. Cecil Barker*). Black Umvulozi River (*R. B. & J. D. S. Woodward*; *Mus. Rothschild*). BECHUANA LAND (*L. Kitching*; *Mus. Brit.*). MATABELE LAND, Tati (*F. Oates*; *Westwood in Oates's Matabele Land*, App. p. 339). Makloutzie River (*F. C. Selous*; *Trimen*, S. Afr. Butterfl. III. p. 113). MASHONA LAND, Mazoe Valley (*Guy Marshall*; *Mus. E. M. Sharpe*). Kamaschy (*Mus. Cecil Barker*). MANICA LAND, Mineni Valley, March (*F. C. Selous*; *Trimen*, P. Z. S. 1894, p. 66). Zambesi River (*Bates Coll.*; *Mus. Salvin-Godman*).

EAST AFRICA.—NYASA LAND. Ioangwa Valley Pass, 4090 feet; Senga, August 28, Mbalizi Valley, Unyika, September 15 (*R. Crawshay*; *Mus. Brit.*). Shirè River (*Bates Coll.*; *Mus. Salvin-Godman*). Deep Bay, West of Lake Nyasa (*R. Crawshay*; *Mus. Brit.*). Fort Johnston (*Dr. P. Rendall*; *Mus. Rothschild*). Lake Mweru (*H. H. Johnston*; *Mus. Brit.*). Makaya District, January, February, and November, 1896 (*F. Kirby*; *Mus. Brit.*). Rabai Hills, July 1889 (*F. J. J.*; *Jackson Coll.*). Taveta, July (*Mus. Rothschild*). ZANZIBAR, Dar-es-Salaam (*Mus. Rothschild*).

EQUATORIAL AFRICA.—Kandera, October (*Emin Pasha*; *Mus. Brit.*). N'guru October and November (*Emin Pasha*; *Mus. Brit.*).

The range of this beautiful butterfly extends from S.E. Africa to S.W. Africa, and north to Teita and Equatorial Africa. It was originally described by Dr. Trimén from the region of Lake N'gami, but there can be no doubt that *T.anax* of Grose Smith, and my own *T. eliza*, described from East Africa, are identical with Dr. Trimén's species from S.W. Africa. It is one of the finest of the purple-tipped section of the genus *Teracolus*, and both sexes have some purple on the apical area of the primaries. There is not very much difference in the appearance between the so-called "wet" and "dry" season forms, but in the latter phase the black markings are more restricted and the purple patch in the male is more brilliant and scintillating.

Dr. Trimén in his celebrated work vol. iii. p. 113, writes: "Mr. T. Ayres informs me that he met with the species 'in numbers for a very short time in December 1875,' among the mountains in the Lydenburg District of the Transvaal, and several examples (including one ♀ of Var. a.) taken near the junction of the Marico and Limpopo Rivers have reached me from Mr. Selous and Mr. Erikson. Mr. John A. Bell, who in 1862 made me first acquainted with the butterfly, brought down

from Damara Land no fewer than sixty-seven specimens, and informed me that it was most abundant on the Botletle, one of the chief streams connected with Lake N'gami. On the eastern side of the interior, the Makloutzie River and Tati seem to be favoured stations of *T. regina*, Mr. Oates having noted it from the latter, and Mr. Selous and Mr. John L. Fry having sent me ticketed specimens from both localities. Mr. Fry's examples from Makloutzie River were taken on the 20th of May 1887, and a male Variety a. from Tati on the 23rd of January. He informs me that at the former place the butterfly was numerous on the purple flowers of a species of *Cineraria*."

With regard to the variation of this species, I quote the following observations made by Dr. Trimen in his paper "On Butterflies from Manica" (P.Z.S. 1894, p. 66). "There are five specimens (all males) of this splendid *Teracolus*, captured in Mineni Valley from the 9th to the 27th of March. These differ slightly from Mr. H. G. Smith's figure of a Mombasa male, having on the underside less irroration basally, a narrower inner black border to the violet apical patch in the fore-wings, and smaller nervular hind-marginal black spots in the hind wings; the last-named markings are also much reduced on the underside of the hind wing. The black spots of the discal series on the underside of the hind-wings vary a good deal in size and distinctness, one example having them just as in Mr. Smith's fig. 6, two others having all but the first and last larger, another wanting the second spot, and the last wanting both second and third spots; the ground-colour is also variable, two examples presenting it creamy instead of pure white. As usual in the genus *Teracolus*, it is impossible to define exact limits between *T. anax* and *T. regina*. The Manica males here noticed, link *T. anax* to the Variety a. of *T. regina* from Damara Land, and so do two others taken by Mr. A. W. Erikson, in 1885, in the belt of country between the Transvaal and Matabele Land; while, as I have noted (*op. cit.* p. 113), another male from the latter tract is intermediate between the Variety a. and typical *T. regina*. Of the two females taken by Mr. Selous in 1882 on the Upper Limpopo, Transvaal boundary, one is typical *T. regina*, but the other is referable to Variety A.; the latter is on the upper side very close to Mr. Smith's figure (7) of female *T. anax*, but has both the basal irroration of the fore-wings and the hind-marginal large black spots considerably broader—the latter, indeed, are so enlarged as to meet and form a continuous border, while on the underside the corresponding spots are very much smaller than in the figure (8) of *T. anax* female. Looking to the evidence afforded by several species of the genus, I am inclined to think that the typical *T. regina*, with greatly reduced dark markings and more or less reddish-tinged underside, and the large *T. anax* form (including my *T. regina* Variety a.), with strongly developed dark markings and white or creamy-white underside, will

turn out to be respectively dry-season and wet-season broods of the same species."

EXPLANATION OF THE FIGURES OF *T. regina*.

- Plate 17, fig. 1. ♂ Nyasa Land (*H. H. Johnston*; *Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Henga, Nyasa Land (*R. Crawshay*; *Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀ Shirè River (*Salvin-Godman Coll.*; *Mus. Brit.*).
 „ 1e. ♀ Makaya District (*F. Kirby*; *Mus. Brit.*).
 „ 1f. ♂ Loangwa Valley Pass, Nyasa Land (*R. Crawshay*; *Mus. Brit.*).
 „ 1g. Underside of fig. 1f.
 „ 1h. ♀ Makaya District (*F. Kirby*; *Mus. Brit.*).

TERACOLUS IMPERATOR, Butler.

(Plate 18, figs. 1, 1a–1i.)

Teracolus imperator, Butler, P. Z. S. 1876, p. 132; *id.* Ann. and Mag. Nat. Hist. (6) vii. p. 47 (1891); Hampson, *t. c.* (6) v. p. 181 (1891); Butler, P. Z. S. 1894, p. 574; E. M. Sharpe, P. Z. S. 1894, p. 348; *id.* in Neumann's Elephant Hunting in East Africa, App. p. 445 (1897); Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 395 (1897); *id.* P. Z. S. 1898, p. 408.
Callosune imperator, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 408 (1877).

Altogether smaller than *T. regina*, and having the purple colour on the apical area of the primaries confined to a narrow band. The secondaries have a distinct dark transverse band in both sexes. The typical form of the female has an orange apical patch on the primaries.

MALE.—Primaries milky-white, from the first median nervule; the hind margin and apex brownish-black, this colour radiating along the nervules; the sub-median nervure entirely black, terminating in a black spot at the posterior angle; the apical area relieved by a fairly narrow band of six ovate spots of iridescent purple, varying in size, the sixth and lowest spot situated above the second median nervule being nearly obsolete; a broad black border from the costal margin to the first median nervule enclosing these purple spots, the basal area thickly dusted with grey. Secondaries milky-white, the black nervules being well pronounced, each one terminating in a black spot on the hind-margin; a sub-median streak of grey extending from the base to the hind-margin.

Underside.—Primaries white, the apical area tinged with pale yellow. Secondaries yellowish-white, with a dark discal band crossing from the costal margin to the first

median nervule, afterwards becoming nearly obsolete; the usual orange basal streak visible on the costal margin. Expanse 2·3 inches. (*Spec. ex. Witu, May 1891; F. J. Jackson Coll.*)

FEMALE.—Primaries with the apex, hind- and inner-margins, brownish-black, heavily pronounced on the latter; a black band crossing the apical area enclosing a bright orange patch, this patch being relieved by a post-median row of black spots; about the centre of the costal margin a broad white band crossing the wings and terminating in an almost ovate spot near the posterior angle, the dark shading at the basal area thickly sprinkled with grey. Secondaries with the central area white; a broad brownish-black border on the hind-margin strongly dentated on its inner aspect; costal margin dark; a narrow dark line crossing the white discal area and so dividing three distinct white spots from the central area; the base dark and thickly dusted with grey, which extends along the sub-median nervule to the hind-margin.

Underside.—Central area of the primaries yellowish-white, the apical portion pale orange, shading to a lighter yellow on the extreme edge of the hind-margin; the post-median row of black apical spots well indicated, the dark shading at the base and on the inner margin also visible. Secondaries pale yellow, somewhat lighter in colour on the discal area, the transverse rufous band and orange costal streak well pronounced; the hind-marginal border dusky yellow. Expanse 2·2 inches. (*Spec. ex. Witu, May 1891; F. J. Jackson.*)

A second form of the female (Pl. 18, fig. 1*d*) only differs from the one above described in the absence of the orange apical patch on the primaries. In this specimen the black apical patch is relieved by three distinct ovate spots of ochre colour; two being nearly obsolete, one near the costal margin, the second situated above the second median nervule. The black hind-marginal border on the secondaries is not so broad.

Underside.—Differs in having a broad black apical band from the costal margin to the first median nervule on the primaries, the apex and hind-margin being of a deeper yellow. Secondaries yellow with rufous-brown vermiculations, the transverse band strongly marked with the same colour. Expanse 2·2 inches. (*Spec. ex. "East Africa"; Mus. Rothschild.*)

Mr. Jackson has in his collection another form of the female which agrees with the second phase above described as regards spots and markings, the apical spots being entirely white instead of ochre-yellow or orange. The underside is much paler and the post-median row of black apical spots on the primaries is distinctly visible; otherwise the markings agree with those of the "orange" form of the female.

"DRY-SEASON" FORM OF MALE.—Differs from that of the "wet-season" form in having the black on the apex and hind-margin less strongly marked, the apical

portion being slightly sprinkled with grey; the post-median black band which encloses the purple spots much narrower, and the grey at the base much less pronounced. The secondaries differ in having no black spots at the end of the nervules on the hind-margin.

Underside.—Primaries white, the apical area being sandy-pink; the secondaries entirely sandy-pink with faint brown vermiculations, the transverse band also brown. Expanse 2·3 inches. (*Spec. ex. Mozambique, July; Dr. J. W. Ansorge; Mus. Rothschild.*)

"DRY-SEASON" FORM OF FEMALE.—Primaries yellowish-white, the apex and hind-margin reddish-brown; a bright orange patch crossing the apical area, which is relieved by a post-median row of five black spots, more or less obsolete; a narrow black line, visible on the inner side, suffused with sulphur-yellow; basal area dusky, thickly sprinkled with grey, extending along the inner margin and terminating in a large black spot about the centre of the wing. Secondaries white, the hind-marginal border consisting of brownish-black spots as far as the second median nervule. A dark spot is also indicated at the end of the costal margin.

Underside.—Primaries yellowish-white, the apical area orange; the post-median row of six black spots more strongly marked than on the upper side; a black streak from the base extending to about the middle of the inner-margin. Secondaries sandy-yellow with the hind-marginal border and transverse band brown, the ground colour thickly sprinkled with brown vermiculations. Expanse 2·2 inches. (*Spec. ex. Zanzibar, July; Dr. J. W. Ansorge; Mus. Rothschild.*)

HABITAT.—SOUTH-EAST AFRICA. Delagoa Bay (*Mus. Rothschild*); Fort Johnston, Nyasa Land (*Mus. Rothschild*); Zomba, Upper Shiré River, April and May 1895 (*Dr. Percy Readall; Mus. Rothschild*). Mombasa, January 1898 (*R. Crawshay; Mus. Brit.*). Takanugu, Nyasa Land, December (*R. Crawshay; Mus. Brit.*).

EAST AFRICA.—Kilimanjaro (*Mus. Rothschild*). Taveta, June 1891 (*Mus. Rothschild*). Mikandani, May and August (*Mus. Rothschild*); Bagamoyo (*Salvin-Godman Coll.; Mus. Brit.*); Zanzibar (*E. C. Buxton; Mus. Brit.*; Type of Species); Dar-es-Salaam (*Mus. Rothschild*); Mamboio (*Mus. Brit.*); Melindi, October 1891 (*Mus. Rothschild*); Mombasa (*Salvin-Godman Coll.; Mus. Brit.*); Wasin Island, June 1888 (*G. D. Trevor-Roper; Mus. Brit.; Gordon S. Gunn; Mus. Brit.*); Witu, May 1891 (*F. J. Jackson Coll.*); Rabai Hills, July 1889 (*F. J. Jackson Coll.*); Kibwezi, December 1888 (*F. J. Jackson Coll.*); Gulu-Gulu to Kibwezi, December 1888 (*F. J. Jackson Coll.*); Coast to Teita, December 1891 (*F. J. Jackson Coll.*); Maungu to Tsavo, December 1891 (*F. J. Jackson Coll.*); Tsavo River, January 1892 (*F. J. Jackson Coll.*); Maungu Hill, 3600 feet, December 1891 (*J. W. Pringle*); March from Teita, 3300 feet, to Voi River, 2100 feet, January 1892 (*J. W. Pringle*); March from Voi River to Ndi, 2300 feet, January 1891 (*J. W. Pringle; E. M. Sharpe, P. Z. S. 1894, p. 348*). Mgana,

August 1896 (*C. S. Betton*; *Mus. Brit.*); Samburu, November (*C. S. Betton*); Taru, December (*C. S. Betton*; Butler, P. Z. S. 1898, p. 408). Sabaki Valley (Hampson, Ann. and Mag. Nat. Hist. (6) vii. p. 181 (1891); *Dr. J. W. Gregory*; Butler, P. Z. S. 1894, p. 574). Kandera, Central Africa (*Emin Pasha*; *Mus. Brit.*; Butler, Ann. and Mag. Nat. Hist. (6) vii. p. 47, 1891).

This species is allied to *T. regina*, but has the purple tip much smaller, and on the secondaries there is a dark transverse line, which crosses the discal area from the costal margin, becoming more broken up towards the sub-median nervure. This band is distinctly visible in both sexes. Another marked distinction is an orange-tipped female. As will be seen by the descriptions given above, there is considerable variation in the females. *T. imperator* seems to be common in the Mombasa district of East Africa, and extends southward to Delagoa Bay, and to Kandera in the interior. Nothing seems to have been published upon the habits and transformations of this species. It should be noted that Mr. Guy Marshall has united this species to *T. phlegyas*, but Dr. Butler keeps them distinct; and urges that they differ both in their "wet" and "dry" season forms. In Dr. Butler's paper on Mr. Betton's collection (P. Z. S. 1898, p. 408) he makes the following remark: "A female whitish-spotted, black-tipped form of the "wet-season" phase, as well as a magenta-glossed, crimson-tipped example (both new to me) were in the series."

EXPLANATION OF THE FIGURES OF *T. imperator*.

- Plate 18, fig. 1. ♂. Witu, May 1891 (*F. J. J.*; *Jackson Coll.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀. Witu, May 1891 (*F. J. J.*; *Jackson Coll.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀. "East Africa" (*Mus. Rothschild*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♂. Mozambique, 12 July 1893 (*Dr. Ansorge*; *Mus. Rothschild*).
 „ 1g. Underside of fig. 1f.
 „ 1h. ♀. Zanzibar (*Mus. Rothschild*).
 „ 1i. Underside of fig. 1h.

TERACOLUS BETTONI, Butler.

(Plate 19, figs. 1, 1a-1h.)

Teracolus phlegyas (pt.), Butler, P. Z. S. 1894, p. 574.*Teracolus bettoni*, Butler, P. Z. S. 1898, p. 409.

MALE.—Differs from *T. imperator* in having the black sub-apical band on the primaries much narrower and in some specimens nearly obsolete. The purple band is also more metallic than in the allied form, the apex more thickly suffused with grey. Secondaries with no black nervular spots on the hind-margin.

Underside.—Entirely white, the apical area of the primaries pale yellow. Secondaries white, the transverse discal line only faintly indicated, the usual basal streak of orange on the costal margin also present. Expanse 2.5 inches. (*Spec. ex. Tsavo River, January; F. J. Jackson Coll.*)

FEMALE.—Distinguished from that of *T. imperator* by the black at the base of the primaries being thickly sprinkled with grey, and extending on the inner-margin in a much narrower line; a distinct brownish-black spot above the sub-median nervure and nearer to the posterior angle; the orange apical patch not so large as in *T. imperator*, and more equally divided by the black post-median row of spots; the white band crossing the wing much broader than in *T. imperator*. Secondaries differing from those of *T. imperator* by having no black on the costal margin or at the base, the whole of the central area being white, the narrow line traversing the discal area distinctly indicated, becoming somewhat broader towards the costal margin.

Underside.—Primaries similar to those of *T. imperator*, the black at the base and on the inner-margin smaller and not so heavily indicated; the apical area more ochraceous. Secondaries entirely pale ochre, with vermiculations of brown on the median nervular area, the hind-marginal border violaceous, and the transverse discal band rufous-brown.

Expanse 2.6 inches. (*Spec. ex. Melindi, January; Mus. Rothschild.*)

A female, which Dr. Butler considers to be an intermediate form (Plate 19, fig. 1d), is entirely sulphur-yellow, the orange apical patch smaller, and the black spot near the posterior angle much reduced in size. Secondaries similar to the primaries, the brownish-black hind-marginal border narrower, and the transverse band not so strongly indicated.

Underside.—Central area of the primaries sulphur-yellow, the dark spots and markings similar to those of the females above described. Secondaries deep buffy-yellow, deepening into russet-yellow on the hind-margin, the ground colour thickly covered with brown vermiculations; the typical transverse line chestnut-brown. Expanse 2.1 inches. (*Spec. ex. Witu; Mus. Rothschild.*)

“DRY-SEASON” FORM OF THE MALE.—Smaller than that of *T. imperator*, with the purple apical band and black markings narrower, the base of the primaries faintly sprinkled with grey, the black nervules on the secondaries not so strongly indicated.

Underside.—The primaries and secondaries are similar below to those of *T. imperator*; the transverse discal line on the latter nearly obsolete and the vermiculations confined to the costal margin. Expanse 2 inches. (*Spec. ex. Sabaki Valley; Dr. J. W. Gregory; Mus. Brit.*).

“DRY-SEASON” FORM OF THE FEMALE.—Similar to the “dry-season” form of *T. imperator*, but differs in having no dark shading on the inner margin of the primaries; the black spot near the posterior angle much smaller. Secondaries similar to those of *T. imperator*.

Underside.—The general colour on both wings darker than in *T. imperator*; the secondaries thickly covered with light brown vermiculations; the transverse discal band broadly shaded with light brown on the inner aspect near the costal margin; the hind-marginal border deep russet yellow. Expanse 2·3 inches. (*Spec. ex. Mozambique, July; Dr. J. W. Ansorge; Mus. Rothschild.*)

HABITAT.—East Africa. Mozambique (*Mus. Rothschild*); Melindi (*Mus. Rothschild*); Witu (*Mus. Rothschild*). Coast to Teita, December (*F. J. J.; Jackson Coll.*). Kibwezi, December (*F. J. J.; Jackson Coll.*). Maurengu to Tsavo, December (*F. J. J.; Jackson Coll.*). Tsavo River, January (*F. J. J.; Jackson Coll.*). Njemps, July (*F. J. J.; Jackson Coll.*). Rabai Hills, July (*F. J. J.; Jackson Coll.*). N'dara Hills, April (*C. S. Betton; Mus. Brit.*). Mgana, August (*C. S. Betton; Mus. Brit.*). Taru Desert, December (*C. S. Betton; Mus. Brit.; Types of species*). Sabaki Valley (*Dr. J. W. Gregory; Mus. Brit.; Butler, P. Z. S. 1894, p. 574, s.n. T. imperator*).

Dr. Butler (*l.c.*) gives the following reasons for the separation of this form: “This species at all seasons differs from the preceding in the extremely narrow and much more glistening lilac apical patch or band on the primaries of the male, its black inner edging almost or wholly wanting, and in the deep indentation or complete separation of the internal black stripe on the primaries of the female; the latter sex is either white or yellow, the apical area being either crossed by an orange patch or a row of white spots, as in *T. imperator*. The dry form of the male differs chiefly from the wet form in the rosy colouring of the apex of the primaries and the whole surface of the secondaries on the under surface, whilst extreme wet types of the male are not only pearly white below, but show an oblique discal series of black spots between the costal vein and second median branch on the underside of the secondaries; the female of the dry phase resembles the wet form of *T. phlegyas* on the upperside and the dry form of that species on the underside; it is, however, larger and shows heavier black markings. Expanse of wings, ♂ 58-71 millim., ♀ 62-69 millim.

Wet form.—♂ ♂ ♀ ♀, Taru, 24th and 25th November, 15th, 18th, 19th, and 20th December, 1896 (one pair taken *in copulâ*).

Intermediate form.—♂, Mgana, 2nd August, 1896. Small, and with white unspotted under surface.

Dry form.—♀, Ndara Hills, 7th April, 1897. Fifteen examples were in Mr. Betton's collection."

EXPLANATIONS OF THE FIGURES OF *T. bettoni*.

- Plate 19, Fig. 1. ♂. Tsavo River, January (*Jackson Coll.*).
 „ 1a. Underside of Fig. 1.
 „ 1b. ♀. Melindi, January (*Mus. Rothschild*).
 „ 1c. Underside of Fig. 1b.
 „ 1d. ♀. Witu (*Mus. Rothschild*).
 „ 1e. ♂. Sabaki Valley (*Dr. J. W. Gregory; Mus. Brit.*).
 „ 1f. Underside of Fig. 1e.
 „ 1g. ♀. Mozambique, July (*Dr. J. W. Ansorge; Mus. Rothschild*).
 „ 1h. Underside of Fig. 1f.

TERACOLUS DIFFICILIS, E. M. Sharpe.

(Plate 20, Figs. 1, 1a–1h.)

Teracolus phlegyas (nec Butler, 1865), Butler P. Z. S. 1893, p. 664; *id. l.e.* 1896, p. 836.

Teracolus phlegyas (part), Trimen, S. Afr. Butterflies, iii. p. 109 (1889); Guy Marshall, P. Z. S. 1897, p. 20; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 396 (1897).

Teracolus jalone, Butler, P. Z. S. 1896, p. 127.

Teracolus ione (part), Aurivillius, Rhop. Æthiopica, p. 429 (1898).

Slightly smaller than *T. bettoni*, and distinguished from that species by the more heavily indicated sub-apical black line on the primaries.

MALE.—Primaries with the costa and basal area grey, the hind-margin black, the apex thickly sprinkled with grey, the black radiating along the nervules; a distinct black spot at the end of the cell. The purple portion of the apical area larger than in *T. bettoni*, some specimens having six spots instead of five, as in that species. The secondaries with the nervules well indicated and terminating in black spots on the hind margin.

Underside.—Similar to that of *T. bettoni*, with the apical area of the primaries pale yellow. Secondaries with no indication of the dark transverse band. A minute discoidal black spot visible on each wing.

Expanse 2.1 inches. (*Spec. ex. Deep Bay; R. Crawshay; Mus. Brit.*)

FEMALE.—Smaller; and with the black markings much less pronounced than in *T. bettoni*.

Primaries with the dark basal area thickly sprinkled with grey; an oblong blackish spot situated above the sub-median nervure near the centre of the inner margin; the orange apical patch larger than in *T. bettoni*; the apex, hind-margin and sub-apical line brownish-black in colour, and with two adjacent vermilion spots situated in the paler orange area of the apical portion of the wing.

Secondaries with the dark nervular spots on the hind-margin smaller than in *T. bettoni*, those near to the inner margin sprinkled with grey and gradually becoming obsolete; the transverse discal line only faintly indicated.

Underside.—Excepting that the black markings are smaller and only faintly marked, the lower surface of this species is similar to that of *T. bettoni*.

Expanse 2.2 inches. (*Spec. ex. Lake Nyasa; Godman-Salvin Coll.; Mus. Brit.*)

A white form of the female in Mr. Rothschild's collection (Fig. 1) only differs from the one above described in having white on the apical area instead of orange; the brownish-black markings of the fore-wing are somewhat more heavily indicated, and the nervular spots on the secondaries are larger, but distinctly separated.

Underside.—The apex of the primaries pale ochre; the sub-apical row of black spots larger and more strongly marked than in the orange-tipped form. Secondaries pale ochre, the transverse discal band darker and plainly indicated.

Expanse 2 inches. (*Spec. ex. Delagoa Bay; Mus. Rothschild.*)

“**DRY-SEASON**” FORM OF MALE.—Smaller than the “wet season” form, with the primaries creamy white, the nervules being also whiter and less distinct; the purple apical patch smaller, brighter in colour and enclosed on the inner edge by a narrow black line, the apex reddish-brown tinged with grey. Secondaries creamy white; the blackish nervules scarcely indicated.

Underside.—Central area of the primaries white; the apex sandy pink sprinkled with light brown vermiculations. Secondaries entirely sandy pink, thickly vermiculated with light brown; a distinct brown transverse band crossing the discal area; a minute brownish spot at the end of the cell.

Expanse 2 inches. (*Spec. ex. Shiré River; Godman-Salvin Coll.; Mus. Brit.*)

“**DRY-SEASON**” FORM OF FEMALE.—General colour of the primaries pale yellow, becoming somewhat deeper towards the brilliant orange apical patch; the apex brownish, a sub-apical row of dark brown crossing the orange patch, which is bordered on its inner aspect by a further interrupted narrow line of brownish-black; a yellowish-green shade overspreading the area of the cell, with the usual black spot at the end of the latter. Secondaries entirely pale yellow with only four nervular spots on the hind-margin more or less faintly indicated.

Underside.—Primaries pale yellow, the orange on the apical area relieved by a sub-apical row of five brownish spots; the basal area sprinkled with grey.

Secondaries sandy-pink covered with brown vermiculations; the transverse discal band reddish-brown with a border of ochre yellow on the hind-margin; a yellow spot above the black discoidal spot. Expanse 2 inches. (*Spec. ex. Loangwa Valley Forest; R. Crawshay; Mus. Brit.*)

HABITAT. NYASA LAND.—Lake Nyasa (*Simons; Godman-Salvin Coll.; Mus. Brit.*). Deep Bay, March 9, 1896; Loangwa Valley Forest, August 30, 1895; Ntonga, Loangwa River, September 13, 1895 (*R. Crawshay; Mus. Brit.; Butler, P. Z. S. 1896, p. 836*). Shiré River (*Bates Coll.; Mus. Godman-Salvin Coll.*). Lake Mweru district, Salim bin Najimb, Konde, January 18, 1893 (*R. Crawshay; Mus. Brit.; Butler, P. Z. S. 1893, p. 664*). MASHONA LAND.—Salisbury, June 18, 1898 (*Guy Marshall; Mus. Brit.*). Delagoa Bay (*Mus. Rothschild*). Henga, W. of Lake Nyasa, January 25, 1895 (*R. Crawshay; Butler, P. Z. S. 1896, p. 127*).

Acting under Dr. Butler's advice, I have given a specific name to the Nyasa-Land form of *T. imperator*. The differences of this race appear to be fairly well pronounced, and in 1897 Dr. Butler (*l.c.*) virtually admitted that the Nyasa-Land *Teracolus* ought to be separated. I reproduce Dr. Butler's remarks under the heading of *T. phlegyas* (*Ann. and Mag. Nat. Hist. (6) xx. p. 396*): "The types of *T. phlegyas* are all from the White Nile, and I am not at all sure that the larger and more heavily marked types which occur considerably further to the south ought not to be kept distinct from them; but until they have been bred it will, perhaps, be safer to regard them as mere local races of one widely distributed species. At the same time it is doubtful whether the species occurs all along the line from the White Nile to Nyasa Land or thence southward to Delagoa Bay; and if a name had already been given to the more southern type, I should certainly have regarded it worthy of respect. As it is, there is so much general resemblance between the wet-season male from Nyasa and the dry-season male from the White Nile in the pattern and colouring of the upper surface, that I hesitate to insist upon keeping them separate."

EXPLANATION OF THE FIGURES OF *T. difficilis*.

- Plate 20, Fig. 1. ♂ Deep Bay, Nyasa Land (*R. Crawshay; Mus. Brit.*). Type of species.
 .. 1a. Underside of Fig. 1.
 .. 1b. ♀ Lake Nyasa (*Godman-Salvin Coll.; Mus. Brit.*).
 .. 1c. Underside of Fig. 1b.
 .. 1d. ♀ Delagoa Bay (*Mus. Rothschild*).
 .. 1e. ♂ Shiré River (*Godman-Salvin Coll.; Mus. Brit.*).
 .. 1f. Underside of Fig. 1e.
 .. 1g. ♀ Loangwa Valley Forest (*R. Crawshay; Mus. Brit.*).
 .. 1h. Underside of Fig. 1g.

TERACOLUS PHLEGYAS (Butler)

(Plate 21, Figs. 1, 1a-1g).

Anthocharis ione, var., Reiche, Ferr. et Gal., Voy. Abyss., pl. xxx., Figs. 3, 4 (1849).*Anthocharis phlegyas*, Butler, P. Z. S. 1865, p. 431, pl. xxv., Figs. 3, 3a.*Euchloe coliagenes*, Butler, Ann. and Mag. Nat. Hist. (3) xx. p. 216, Figs. 4-5 (1867).*Euchloe jalone*, Butler, Cist. Ent. i. p. 14 (1869).*Teracolus phlegyas* (part), Trimen, S. Afr. Butterflies, iii. p. 109 (1889); Guy Marshall, P. Z. S. 1897, p. 20.*Teracolus phlegyas*, E. M. Sharpe, P. Z. S. 1896, p. 535; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 396 (1897).*Teracolus ione*, var. *phlegyas*, Aurivillius, Rhop. Æthiopica, p. 429 (1898).

Similar to *T. bettoni* and *T. difficilis*, but distinguished at once by its smaller size and the more or less obsolete black markings.

MALE.—Primaries with the purple apical patch rather bright in colour. Secondaries with the black veins strongly indicated, and terminating in black spots on the hind-margin.

Underside.—Both wings white, the black veins also visible on the secondaries.

Expanse 1.7 inch. (*Spec. ex. White Nile; Mus. Brit.*)

FEMALE.—Primaries and secondaries sulphur-yellow, the apical area of the former crossed on the inner edge by a row of brownish spots, the apex and hind-margins of both wings also brownish.

Underside.—Central area of primaries sulphur yellow, the apex ochraceous, the marginal area crossed by a post-median row of light brown spots. Secondaries pale ochraceous yellow, with a distinct transverse band of light brown crossing the discal area.

Expanse 1.6 inch. (*Spec. typ. ex. White Nile; Mus. Brit.*)

“DRY-SEASON” FORM OF MALE.—Similar to that of the “wet-season” form, the purple apical patch somewhat more restricted; the apex thickly dusted with grey, which is also visible at the base of the wing. Secondaries not differing from the “wet-season” form.

Underside.—Central area white, the apex pinkish-yellow. Secondaries also pinkish-yellow, the discal area crossed by a chestnut band as far as the second median nervule.

Expanse 2.3 inches. (*Spec. typ. ex. White Nile; Godman-Salvin Coll.; Mus. Brit.*)

“DRY-SEASON” FORM OF FEMALE.—Primaries differing from the wet-season form in having no dark shading at the base of the wings; the brownish sub-apical line

almost obsolete, but terminating in a large spot above the first median nervule. Secondaries pale yellow, the nervules terminating on the hind-margin in brownish spots.

Underside.—Primaries similar to those of *T. difficilis*, the post-median row of brownish spots somewhat more strongly indicated. Secondaries entirely sandy pink, but with no vermiculations, the discal transverse rufous band strongly marked and curving round and following the outline of the wing as far as the sub-median nervure.

Expanse 1·7 inch. (*Spec. typ. ex. White Nile; Godman-Salvin Coll.; Mus. Brit.*)

HABITAT.—Abyssinia (Ferret and Galinier, *Voy. Abyss.*, pl. xxx. Figs. 3, 4, 1849). White Nile (*Consul Petherick; Mus. Brit.*). SOMALI LAND.—Sheik Husein, Sept. 26 (*Dr. Donaldson Smith; E. M. Sharpe, P. Z. S. 1896, p. 535*).

T. phleggyas is, in my opinion, the type of a separate group of purple-tipped *Teracoli*, in which the black vein-lines are more or less obsolete. To this group belong *T. phleggyas*, *T. burtoni* and *T. ione*, which present an almost uniform white upper surface in the males, and have the females much less heavily marked, as can be seen from the figures in the plates.

With regard to the plate of *T. ione* in Ferret and Galinier's "Voyage en Abyssinie," I consider that Figs. 3 and 4 can be referred to *T. phleggyas*, while the other figures represent *T. imperator*.

Of the forms recognised by me in the present "Monograph," which is avowedly founded on Dr. Butler's arrangement of the genus *Teracolus* in the British Museum, the following, admitted by Dr. Butler as distinct, are merged by Mr. Guy Marshall under *T. phleggyas*—viz. *Teracolus burtoni*, *T. imperator*, and *T. bacchus*.

I reproduce Mr. Guy Marshall's remarks on *T. phleggyas* and its allies: "The male type of this highly variable species is a dwarfed specimen from the White Nile, and its most distinctive character is that the underside of the hind wings is white, with all the neuration finely blackened throughout. From Wadelai and Njemps I have seen very similarly marked specimens, which are, however, of much larger size, being quite equal to the *T. imperator* form.

"The only important difference between these examples and *T. bacchus*, Butler, which is recorded from Wadelai, Kanderu, and the Sabaki Valley, is that the latter has the underside neuration very heavily blackened, which certainly gives it a very distinct appearance; but the development of the black neuration is such an eminently unreliable character in this genus that I cannot consider it a good species. *T. mrogoroana* from 'Zanguebar' is identical with *T. bacchus*, the differences referred to by M. Vuillot appearing to me to be absolutely trivial. *T. phleggyas* also varies in the opposite direction, namely, in the gradual loss of the black neuration below until the

underside of the hind wing becomes pure white without any markings whatever. Such specimens, however, seem to be rare, as there is nearly always some trace of the oblique dusky discal ray from costa, which is so characteristic of the group. It was on a dry-season specimen of this variety that Dr. Butler founded his *T. jalone*, which has the underside of secondaries of a pinkish tinge with a faint discal ray. This again merges gradually into *T. imperator* (Central East Africa) both in the development of the discal ray and in the tendency to assume a sixth spot in the purple apical patch, which is generally present in that species, but is very variable in size, and sometimes absent. *T. ione*, Trim. (part), and *T. jalone*, var. *natalensis*, Staud., represent the Natal form of the species, which differs from *T. imperator* in its smaller size, the absence of the sixth spot in apical patch, and the rather stronger development of the inner black edging of the purple; but specimens from Mashona Land and the Transvaal show every intergrade between the two forms.

"In the quasi-tropical coast-belt of Natal another variation occurs, in which the purple patch is slightly reduced owing to the broadening of the inner black edging, and the ends of nervules on the underside of hind wings are strongly blackened, and often terminating in spots on the hind-margin. *T. burtoni* is the normal dry-season form of the species in South Africa, the Central African specimens being noticeably larger. Although the males of this species are so variable, the females are even worse and the variations are not so localised. Not only does the ground-colour vary from white to bright yellow, but even the discal black markings are apt to be very much reduced, and the apical patch may be either red or black; in the latter case it contains a row of small spots, which may be either white, yellow, or red. The tints of the underside also vary much, and there seems to be sporadic tendency to blackening of nervules.

"*T. phlegyas* ranges throughout East Africa from Natal to Abyssinia, and in the Southern Tropic it extends westwards to Damara Land and Ovampo Land."

Dr. Butler writes:—" *T. phlegyas*, in all its forms, can be distinguished from *T. imperator* by its somewhat inferior size, the whitish scaling in spots upon the apical border of the males, and the transverse bar on the under surface of the secondaries being usually more broken up. The females are much less heavily marked on the upper surface.

"*T. coliagenes*, which Mr. Marshall regarded as linking the *T. eris* and *T. fausta* groups, is certainly nothing more or less than the wet-season female of the typical male of *T. phlegyas*; the female which I described is the dry-season type, and therefore is that sex of *T. jalone*."

EXPLANATION OF THE FIGURES OF *T. phlegyas*.

- Plate 21, Fig. 1. ♂ White Nile (*Consul Petherick* ; *Mus. Brit.*).
 „ 1a. Underside of Fig. 1.
 „ 1b. ♀ White Nile (*Consul Petherick* ; *Mus. Brit.*; *Type of T. coliaenes*).
 „ 1c. Underside of Fig. 1b.
 „ 1d. ♂ White Nile (*Godman-Salvin Coll.* ; *Mus. Brit.* ; *Type*).
 „ 1e. Underside of Fig. 1d.
 „ 1f. ♀ White Nile (*Consul Petherick* ; *Mus. Brit.* ; *Type*).

TERACOLUS BUXTONI, Butler.

(Plate 22, Figs. 1, 1a-1h.)

Teracolus buxtoni, Butler, P. Z. S. 1876, p. 130 ; *id.* Ann. and Mag. Nat. Hist. (6) xx. p. 397 (1897).*Callosune buxtoni*, Kirby, Syn. Cat. Diurn. Lepid. Suppl., p. 803 (1877) ; Westw. App. Oates' Matabele Land, p. 340, pl. E., Figs. 7, 8 (1881) ; *id. op. cit.* edit. 2, p. 346, pl. 5, Figs. 7, 8 (1889).*Callosune jalone*, var. *natalensis*, Staud. Exot. Schmett., p. 44 (1888).*Teracolus phlegyas* (pt.), Trimen, S. Afr. Butterflies, iii. p. 109 (1889) ; Guy Marshall, P. Z. S. 1897, p. 20.*Teracolus ione* (pt.), Aurivillius, Rhop. Æthiop. p. 429 (1898).Slightly larger than *T. phlegyas*, with the black markings more heavily indicated.

MALE.—Primaries similar to those of *T. difficilis*, but with the magenta-coloured apical band narrower and more purplish in tint, this band being restricted to five spots instead of six ; the black apex slightly sprinkled with grey. Secondaries white, the black nervules terminating in well-pronounced black spots on the hind-margin.

Underside.—Primaries white, the apex and hind-margin tinged with pale yellow. Secondaries pale yellow, the nervules on the hind-margin terminating in black spots, which extend along the veins as far as the discoidal cell ; a very distinct black transverse band traversing the discal area and terminating above the third median nervule ; a small dark spot visible between the second and third median nervules.

Expanse 2.1 inches. (*Spec. ex Malvern, Natal* ; *Cecil H. Barker* ; *Trimen Coll.*)

FEMALE.—Similar to that of *T. difficilis*, the white central area of the primaries being tinged with pale yellow. In other respects the species does not differ from its allies as regards the orange apical patch and the extent of the black markings. Secondaries with the white area tinged with pale yellow, the black nervular spots on the hind-margin larger and more strongly indicated, as is also the black costal spot.

Underside.—General colour of the primaries similar to *T. difficilis*, the apex more

ochreous-yellow in tint and faintly sprinkled with thin wavy lines. Secondaries entirely reddish-buff, thickly vermiculated, with the discal transverse band darker and more complete on the contour of the wing.

Expanse 2.2 inches. (*Spec. ex Malvern, Natal; Cecil H. Barker; Trimen Coll.*)

A second form of the female (Fig. 1b) differs from that above described in having the apical area of the primaries black instead of orange, with three yellowish-white spots varying in size, in somewhat strong contrast. A large and similarly coloured spot breaks the black hind-marginal border near the posterior angle; the inner margin is brownish-black, with the basal area dark and thickly sprinkled with greenish-grey. Secondaries yellowish-white, shaded with grey at the base of the wing, with the brownish-black hastate nervular spots on the hind-margin strongly indicated, as well as the transverse discal line.

Underside.—Primaries yellowish-white, the apical area yellow, crossed by a post-median row of black spots, one large spot being situated about the middle of the inner margin; the basal area greenish with darker shading. Secondaries pale ochreous-yellow, deepening in tint towards the basal area, the nervules black; the usual dark transverse discal band well indicated, but more broken up towards the inner margin.

Expanse 2 inches. (*Spec. ex Malvern, Natal; Cecil H. Barker; Trimen Coll.*)

“DRY-SEASON” FORM OF MALE.—General aspect very similar to that of *T. difficilis*, the markings being also similar.

Underside.—Apical area of the primaries and secondaries somewhat paler in colour. In other respects the spots and markings agree with those of *T. difficilis*.

Expanse 2.2 inches. (*Spec. ex Khama's Country; Cecil H. Barker; Trimen Coll.*)

“DRY-SEASON” FORM OF FEMALE.—Central area of the primaries entirely creamy-white, faintly shaded with grey at the base; the orange apical patch brighter. Secondaries with only the first two nervular spots on the hind-margin fairly indicated.

Underside.—Central area entirely white, the dark post-median row of spots near the apex smaller and nearly obsolete. Secondaries much darker, but otherwise not differing from *T. difficilis*.

Expanse 2.3 inches. (*Spec. ex Khama's Country; Cecil H. Barker; Trimen Coll.*)

HABITAT.—South-East Africa. Natal (*Miss M. C. Heaton; Mus. Brit.*). Malvern, Natal, March 1896 (*Guy Marshall; Coll. E. M. Sharpe; C. H. Barker; Trimen Coll.*). Weenen, Natal (*Mus. Rothschild*). Pietermaritzburg, Natal (*Mus. Rothschild*). Tugela River, 2500 feet, November 10 and 15, 1896 (*Guy Marshall; Mus. Brit.*). Delagoa Bay (*E. C. Buxton; Mus. Brit.*). Etchowe, Zulu Land (*R. B. and J. D. S. Woodward; Coll. E. M. Sharpe*). Swazi Land (*E. C. Buxton; Trimen, l.c., p. 10*).

TRANSVAAL. Limpopo River, June 1893 (*Coll. Guy Marshall*). Marico and Limpopo Rivers (*F. C. Selous—Var.*). Lydenburg District (*T. Ayres—Var.*; Trimen, *l.c.*, p. 110).

BECHUANA LAND (*C. H. Barker; Trimen Coll.*).

MATABELE LAND. Tati (*F. Oates; Westwood, l.c.*, p. 340). Makloutse River (*F. C. Selous—Var.*).

ZAMBESI RIVER. Zumbo (*F. C. Selous—Var. Trimen, l.c.*, p. 111).

SOUTH-WESTERN AFRICA. Damara Land (*H. Hutchinson and W. C. Palgrave—Var.*; Trimen, *l.c.*, p. 111).

I have seen many examples of this species from Natal and from Zulu Land, and others from the Transvaal and Bechuana Land, which appear to be identical with those from Natal. Dr. Trimen mentions that specimens from Matabele Land, from the Zambesi, and from Damara Land vary somewhat from the typical form, but I have not myself seen any specimens from these localities, and I am unable to pronounce an opinion on the subject.

Dr. Trimen does not allow that *T. burtoni* is distinct from *T. phleggyas*. He writes:—"The typical *T. phleggyas* inhabits the Soudan (White Nile) and Abyssinia, and the variety *T. burtoni* is known to inhabit the tropical belt from the Zambesi southward, and on the eastern side to penetrate as far as the Transvaal and Swazi Land. I have not seen any but red-tipped females referable to this species. Westwood's figures (*op. cit.*) are somewhat larger and more strongly marked than any specimen I have seen, and indeed than, from his own description, would appear to have been among Mr. Oates's examples. The late Mr. E. C. Buxton sent me coloured photographs of Swazi Land specimens of the butterfly."

Dr. Butler, in his latest revision, says:—"The wet-season form of this local representative of *T. phleggyas* comes nearer to *T. ione*, only the male has a very strongly defined blackish stripe across the under surface of the secondaries; the female has the sub-apical white spots, small and greyish in colouring and the basal area very dark, whilst the bar on the secondaries is more strongly marked and the spots of the marginal border extend further up the nervures. This is the *T. natalensis* of Staudinger.

"The dry-season form is represented by *T. burtoni*, of which we only possess a pair in the general series, but of which there are four others in the Hewitson Collection. In this form the upper surface of the male resembles that of the wet-season type of *T. phleggyas*, but the female nearly approaches the dry-season form of the same."

I have already referred to Mr. Guy Marshall's opinion on the species under the heading of *T. phleggyas*.

EXPLANATION OF THE FIGURES OF *T. buxtoni*.

- Plate 22, Fig. 1. ♂ Malvern, Natal (*C. H. Barker; Trimen Coll.*).
 „ 1a. Underside of Fig. 1.
 „ 1b. ♀ Malvern, Natal (*C. H. Barker; Trimen Coll.*).
 „ 1c. Underside of Fig. 1b.
 „ 1d. ♀ Malvern, Natal (*C. H. Barker; Trimen Coll.*).
 „ 1e. ♂ Khama's Country (*C. H. Barker; Trimen Coll.*).
 „ 1f. Underside of Fig. 1e.
 „ 1g. ♀ Khama's Country (*C. H. Barker; Trimen Coll.*).
 „ 1h. Underside of Fig. 1g.

TERACOLUS IONE (Godart)

(Plate 23, Figs. 1, 1a-1k).

- Pieris ione*, Godart, Enc. Méth., ix. p. 140 (1819); Boisduval, Sp. Gen. Lépid., i. p. 515, no. 112 (1836).
Anthracaris ione, Delegorgue, App. Voy. Deleg. Afr. Austr., p. 587 (1847).
Anthracaris erone, Angas, Kafir. Illustr., pl. xxx. Fig. 3 (1849).
Anthopsyehe ione, Wallengren, K. Sv. Vet. Akad. Handl. Lepid. Rhop., p. 15 (1857).
Anthopsyehe speciosa, id., t.e., p. 16 (1857).
Anthracaris ione, Hopffer in Peters' Reise Mossamb. Ins., p. 357, pl. 21, Figs. 1-6 (1862); Trimen, Rhop. Afr. Austr., i. p. 43, n. 26 (1862).
Euchloe jobina, Butler, Cist. Ent., i. p. 14 (1869).
Callosune ione, Kirby, Syn. Cat. Diurn. Lepid., p. 500 (1871).
Callosune jobina, Kirby, t.e., p. 504 (1871).
Teracolus jobina, Butler, Lepid. Exot., p. 116, pl. xliii. 1-3 (1872 ♂).
Teracolus ione (pt.), Butler, Proc. Zool. Soc. Lond. 1876, p. 132.
Callosune jobina, Kirby, Syn. Diurn. Lepid. Suppl., p. 803 (1877).
Callosune jobina, var. Staud. Exot. Schmett., i. pl. 23 (1884).
Callosune ione, Westw. App. Oates' Matabele Land, p. 338 (1881); edit. 2, p. 345 (1889).
Teracolus ione, Trimen, S. Afr. Butterflies, iii. p. 101 (1889).
Teracolus speciosus, id., t.e., iii. p. 105 (1889).
Teracolus jobina, id., t.e., iii. p. 107 (1889).
Teracolus ione, Trimen, P.Z.S. 1894, p. 65; Butler, P.Z.S. 1896, p. 836; Gny Marshall, P.Z.S. 1897, p. 18; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 397 (1897); Aurivillius, Rhop. Æthiop., p. 429 (1898).

Distinguished from *T. buxtoni*, Butler, by the much greater amount of black on the apex, hind-margin and inner band of the primaries. The purple patch is of a very rich tint, and the ground colour of both wings is creamy-white. The females show much less black on the inner margin of the primaries.

MALE.—Similar to *T. difficilis*, but the general aspect is creamy-white, the black inner border being very wide and strongly marked, the purple band consisting of five

spots varying somewhat in size. Secondaries more creamy-white, the black nervules not so strongly indicated, the black spots on the hind-margin being separated and much smaller in size.

Underside.—Central area white, the apical portion sulphur-yellow. Secondaries entirely sulphur-yellow, the nervules thinly streaked with black on the hind-margin, the typical transverse band being merely indicated by a large dark spot at the end of the costal nervure.

Expanse 2.2 inches. (*Spec. ex Natal; Mus. Rothschild.*)

FEMALE.—The orange patch on the primaries reduced as regards its length and breadth; the post-median row of black spots larger and more hastate; a large black spot situated above the sub-median nervure, near the posterior angle. Secondaries very similar to those of *T. buxtoni*.

Underside.—Central area of the primaries white; the apical portion yellow, with the post-median row of black spots well pronounced. Secondaries entirely sulphur-yellow, the dark transverse discal line strongly indicated, and with faint vermiculations visible toward the inner margin.

Expanse 2.1 inches. (*Spec. ex Malvern, Natal; Guy Marshall Coll.*)

The white form of the female is similar to that of *T. buxtoni* (Fig. 1b), excepting that a black spot near the posterior angle is visible, instead of the black extending along the whole of the inner margin. Secondaries like those of the orange form (Fig. 1d).

Underside.—Similar to that of the orange-coloured female above described.

Expanse 2 inches. (*Spec. ex Malvern, Natal; Cecil Barker; Trimen Coll.*)

INTERMEDIATE FORM OF MALE.—The apex, hind-margin, and inner band narrower and browner in colour; the purple band also more restricted. Secondaries with the black nervular spots on the hind-margin nearly obsolete.

Underside.—Apical area of the primaries pinkish; the secondaries entirely pinkish, with faint vermiculations.

Expanse 2.1 inches. (*Spec. ex Malvern, Natal; Cecil Barker; Trimen Coll.*)

INTERMEDIATE FORM OF FEMALE.—Very similar to the one figured (1b), with the white sub-apical row of spots larger. Secondaries with the black nervular spots less pronounced and disconnected.

Underside.—Central area of the primaries white, the apex sandy-yellow. Secondaries entirely sandy-yellow, covered with brownish vermiculations.

Expanse 2.2 inches. (*Spec. ex Durban; Mus. Rothschild.*)

"DRY-SEASON" FORM OF MALE.—Smaller than the "wet-season" form; the black markings on the primaries much reduced; the base of the wing slightly sprinkled

with grey. Secondaries entirely white, the three nervules near the apex streaked with black on the hind-margin.

Underside.—Apex of the primaries bright sandy-pink. Secondaries of the same colour, the entire wing thickly covered with brownish vermiculations, the transverse band indicated on the costal margin, and the discoidal spot strongly marked.

Expanse 2 inches. (*Spec. ex Malvern, Natal; Cecil Barker; Trimen Coll.*)

“DRY-SEASON” FORM OF FEMALE.—Very similar to that of *T. buxtoni* (fig. 1g), but much smaller, and the black apical markings rather more pronounced; the black spot near the centre of the inner margin nearly obsolete. Secondaries with the black nervular spots on the hind-margin more strongly pronounced.

Underside.—Similar to that of *T. buxtoni*, but with the secondaries more distinctly covered with vermiculations.

Expanse 2·7 inches. (*Spec. ex Malvern, Natal; Cecil Barker; Trimen Coll.*)

The white form only differs in the absence of orange on the primaries, the brownish-black apical area being much reduced and relieved by four white spots varying in size.

Expanse 2·1 inches. (*Spec. ex Malvern, Natal; Cecil Barker; Trimen Coll.*)

HABITAT.—South-East and South-West Africa, north to the Zanzibar District in East Africa.

NATAL. Durban (*G. E. Shelley; Godman-Salvin Coll. Mus. Brit.*). Pinetown and Northdene (*J. H. Bowker; Trimen, S. Afr. Butl., iii. p. 109, 1899*). Lower Umkomazi (*J. H. Bowker; Trimen, t.c., iii. p. 107, 1889*). Malvern, 800 feet, August 10, 1896 (*Guy Marshall; Mus. Brit.*). Tugela River, August 1893 (*Mus. Rothschild*). Verulam, Mouth of Tugela River (*J. H. Bowker; Trimen, t.c., iii. p. 109, 1899*).

SWAZI LAND (*E. C. Buxton; Trimen, t.c., iii. p. 109, 1889*).

PORTUGUESE SOUTH AFRICA. Lourenço Marques (*Mrs. Monteiro; Trimen, t.c., iii. p. 105, 1889*). Makaya District (*F. Kirby; Mus. Brit.*).

TRANSVAAL. Limpopo and Marico Rivers (*F. C. Selous; Trimen, t.c., iii. p. 105, 1889*). Lydenburg District (*T. Ayres; Trimen, t.c., iii. p. 105, 1889*).

BECHUANA LAND. (*C. H. Barker; Trimen Coll.*)

MATABELE LAND. Tati (*F. Oates; Westw., t.c., p. 338, 1881*).

MANICA LAND. Mineni Valley (*F. C. Selous; Trimen, P. Z. S. 1894, p. 65*).

MOZAMBIQUE, July 12, 1893 (*Dr. J. W. Ansorge; Mus. Rothschild.*)

ZANZIBAR. (*Mus. Rothschild.*)

DAMARA LAND. Ovampo Land, Ovaquenyama (*A. Eriksson; Trimen, P. Z. S. 1894, p. 65*).

This species has been well described by Wallengren as *Anthopsychene speciosa*, but

Dr. Butler and Mr. Guy Marshall are both agreed that Godart's name of *ione* is the oldest, and I have followed them in this determination. I need not here reproduce the long series of arguments which the above-named authors adduce as their reason for not adopting the nomenclature of Dr. Trimen's standard work on the Butterflies of South Africa, but I also think that Godart's name may properly be used in place of Wallengren's, which Dr. Trimen employed.

T. jobina is the "dry-season" form of *T. ione*, and must be united with it. *T. speciosa* is considered by Dr. Trimen to be a local form confined to the coast district of Natal, but I have examined many specimens from the Transvaal and other parts of Africa, and I consider that the range of the species must be extended as detailed above. He has also identified specimens from Manica Land and Ovampo Land as belonging to *T. ione*.

Dr. Trimen writes of *T. speciosa*: "I met with it in abundance about Durban at the end of January, all through February, and again at the end of March and beginning of April 1867. Colonel Bowker has taken it freely in December also. The red-tipped form of the female is much less frequently met with than the other. I fell in with three specimens only during my visit, and Colonel Bowker has also noted its scarcity as compared with the black and white female. The lovely male is a very active and even rapid flyer, but the female is much slower in her movements. Both sexes are fond of flowers, and I captured the finest specimens I obtained on those of *Vinca rosea* and of *Lantana* in the Botanic Gardens on the Berea Hill. On the 1st of February I observed and netted a male and a red-tipped female playing together close to the ground. I did not meet with the species anywhere away from the neighbourhood of Durban."

Of *T. jobina*, which he was inclined to separate from *T. speciosus* in 1889, Dr. Trimen also observes: "*T. jobina* seems to occur solely as a winter (or dry-season) butterfly. Apart from the non-typical individuals just mentioned as captured in April (which are, however, much nearer to true *T. jobina* than to *T. speciosus*), all the specimens whose dates of capture are known to me were taken in May, June, July, and August. I never saw this small form during my summer visit, which ended on April the 9th; nor, on the other hand, am I aware of *T. speciosus* appearing on the wing except in the summer or wet-season. It seems not impossible that the two butterflies may turn out to be summer and winter broods of the same species (this is the opinion of Mr. A. D. Millar, an observer of long residence at Durban). The dated specimens of *T. jobina*, which he has kindly sent to me, are two males captured on the 22nd of August, one male on the 22nd of September, and two males on the 24th, but this could only be proved by careful breeding from the egg. As far as my records go, *T. jobina* has a wider range than *T. speciosus*, Colonel Bowker having

met with it as far northward as the mouth of the Tugela River, and (judging from photographs and MS. sent to me) the late Mr. E. C. Buxton having taken it in Swazi Land."

EXPLANATION OF THE FIGURES OF *T. ione*.

- Plate 23, fig. 1. ♂ Natal (*Mus. Rothschild*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Malvern, Natal (*C. H. Barker ; Trimen Coll.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀ Malvern, Natal (*C. H. Barker ; Trimen Coll.*).
 „ 1e. ♂ Malvern, Natal (*C. H. Barker ; Trimen Coll.*).
 „ 1f. ♀ Durban (*Mus. Rothschild*).
 „ 1g. ♂ Malvern, Natal (*C. H. Barker ; Trimen Coll.*).
 „ 1h. Underside of fig. 1g.
 „ 1i. ♀ Malvern, Natal (*C. H. Barker ; Trimen Coll.*).
 „ 1j. Underside of fig. 1i.
 „ 1k. ♀ Malvern, Natal (*C. H. Barker ; Trimen Coll.*).

TERACOLUS BACCHUS, Butler.

(Plate 24, Figs. 1, 1a-1h.)

Teracolus bacchus, Butler, P. Z. S. 1888, p. 73; Grose Smith and Kirby, Rhop. Exot. Callosune I, pl. Figs. 1-4 (1889); Butler, Ann. and Mag. Nat. Hist. (6) vii. p. 47 (1891); *id. op. cit.* (6) xx. p. 398 (1897); Aurivillius, Rhop. Æthiopica, p. 429 (1898).

Callosune mrogoana, Vuillot, Bull. Soc. Ent. France, 1891, pp. ci.

Teracolus phleggyas (part), Guy Marshall, P. Z. S. 1897, p. 20.

Distinguished from all the other purple-tipped species of the genus *Teracolus* by having the black nervules on the upper surface of both wings, as well as those of the underside, very strongly marked. This distinctive character is even more pronounced in the females.

MALE.—Primaries similar to those of *T. imperator*, but with the apex entirely grey, and the inner black border of the purple patch much narrower. Secondaries scarcely differing from those of *T. imperator*.

Underside.—Primaries and secondaries both entirely white, the black nervules strongly marked on both wings, but having the black transverse band on the secondaries more broken up than in the allied species.

Expanse 2.1 inches. (*Spec. ex Gulu-Gulu ; Jackson Coll.*).

FEMALE.—Similar to that of *T. imperator*, but with the orange apical patch on the primaries narrower and entirely separated by the black nervules, thus giving to the

orange patch a more hastate appearance ; the brownish-black basal area more restricted and thickly sprinkled with grey ; the dark border on the inner margin more broken ; while, on the extreme edge, near the posterior angle, a streak of white is visible. Secondaries not differing from those of *T. imperator*, excepting that the transverse band is more distinctly marked.

Underside.—Both wings similar to those of *T. bettoni* (fig. 1c), the veins being strongly marked ; the rufous transverse band on the secondaries very distinct, while the post-median band of black spots is somewhat larger than in the allied species.

Expanse 2·3 inches. (*Spec. ex Tsavo River : Jackson Coll.*)

A second form of the female (fig. 1d) has the characteristic apical spots white instead of orange. These white spots vary in size, and are entirely separated by the black nervules. Basal area and inner margin thickly dusted with grey, with a distinct black spot apparent above the sub-median nervure, close to the posterior angle. Secondaries very similar to those of the example above described, but having a whiter appearance.

Underside.—The apical area of the primaries and the ground colour of the secondaries sulphur-yellow instead of ochre-yellow. The spots and markings otherwise similar to those of the foregoing specimen (fig. 1c).

Expanse 1·1 inches. (*Spec. ex Kibwezi ; Jackson Coll.*)

A third form of the female, which Dr. Butler considers to be “intermediate,” is similar to the typical form (fig. 1b), but the ground-colour of both the primaries and secondaries is sulphur-yellow ; the black spot near the posterior angle is also rather smaller.

Underside.—Ground-colour of both wings sulphur-yellow, the post-median row of blackish-brown spots on the primaries smaller ; the transverse band on the secondaries also reduced in extent.

Expanse 2·3 inches. (*Spec. ex Teita ; Jackson Coll.*)

“INTERMEDIATE” FORM OF MALE.—Primaries with the black nervules not so heavily marked, the apex with less grey, and the general appearance more of a pinkish-white tint. Secondaries with no black nervular spots on the hind-marginal border.

Underside.—The general colour of both wings faintly tinged with pink, the nervules being rather more strongly marked with pink instead of black, as in the extreme “wet-season” forms.

Expanse 2·2 inches. (*Spec. ex Kilimanjaro ; Bishop Hannington ; Mus. Brit.*)

There is another “INTERMEDIATE” FORM OF FEMALE, which is very similar to that of *T. imperator* (Plate 18, fig. 1h), but has the inner margin of the primaries white, and the black spot above the sub-median nervure somewhat smaller, the brownish-black hind margin being rather broader. Secondaries with the brownish-black hind-

marginal border decidedly broader and more connected than in the "dry-season" form of *T. imperator*.

Underside.—Similar to that of the "dry-season" form (fig. 1e), the secondaries being a little paler as regards their ground colour.

Expanse 2·2 inches. (*Spec. ex Kibwezi; Jackson Coll.*)

In the British Museum series of *T. bacchus* are two females, both of which Dr. Butler considers to be "intermediate" forms. One is an orange-tipped specimen from Mamboio, collected by Mr. Last, from the Godman-Salvin Collection. It is rather darker and more heavily marked than the one figured in my Plate (fig. 1h).

The second is from Lado, collected by Emin Pasha, and it is similar to the specimen figured by me (fig. 1h) as regards its markings, but the apical area of the primaries is white instead of orange.

The extreme "dry-season" form is at present unknown.

HABITAT.—From Equatorial Africa to the coast of East Africa.

EQUATORIAL AFRICA.—Kandera (*Emin Pasha; Mus. Brit.*); Lado, August 1884 (*Emin Pasha; Mus. Brit.*); Wadelai, January 1887 (*Emin Pasha; Mus. Brit.*); Butler, P.Z.S. 1888, p. 73.

BRITISH EAST AFRICA.—Coast to Teita, December 1891 (*F. J. J.; Jackson Coll.*); Tsavo River, January 1892 (*F. J. J.; Jackson Coll.*); Gulu-Gulu—Kibwezi, November and December 1888 (*F. J. J.; Jackson Coll.*); Kibwezi, December 1888 (*F. J. J.; Jackson Coll.*).

GERMAN EAST AFRICA.—Mamboio (*Last; Godman-Salvin Coll.; Mus. Brit.*); Kilimanjaro (*Bishop Hannington; Mus. Brit.*); Nahinokwe, January 1894 (*Dr. J. W. Ansorge; Mus. Rothschild*).

This seems to me to be one of the most distinct of all the forms of *T. imperator*, though I must confess that I am unable to account for all its supposed variations according to season.

Dr. Butler makes the following remarks:—"Ranges from Lado, north of the Albert Nyanza, southwards to Mamboio and the Nguru hills, and eastwards to Kilimanjaro.

"The wet-season form is characterised as distinct from *T. imperator* by its inferior size, the heavy black veining on both surfaces, the well-defined grey internervular spots on the apical border of the primaries in the male, and the rudimentary character of the transverse band on the under surface of the secondaries in that sex; it possesses also two forms of female, as is the case with *T. ione*. The dry-season male is somewhat larger, with the black veins much less defined above, and almost, or altogether, wanting below, the black marginal spots also wanting on the upper surface of the secondaries. Our two male examples of this form are not quite fresh, and there-

fore the colouring below is not very defined, but it does not seem ever to have been rosy. It is possible, therefore, that a still drier type may remain to be discovered."

EXPLANATION OF THE FIGURES OF *T. bacchus*.

Plate 24, Fig. 1. ♂ Gulu-Gulu; November and December 1888 (*F. J. J.*; *Jackson Coll.*).

- „ 1a. Underside of fig. 1.
- „ 1b. ♀ Tsavo River, January 1893 (*F. J. J.*; *Jackson Coll.*).
- „ 1c. Underside of fig. 1b.
- „ 1d. ♀ Kibwezi, December 1888 (*F. J. J.*; *Jackson Coll.*).
- „ 1e. ♀ Coast to Teita, December 1891 (*F. J. J.*; *Jackson Coll.*).
- „ 1f. ♂ Kilimanjaro (*Bishop Hannington*; *Mus. Brit.*).
- „ 1g. Underside of fig. 1f.
- „ 1h. ♀ Kibwezi, December 1888 (*F. J. J.*; *Jackson Coll.*).
- „ 1i. Underside of fig. 1h.

TERACOLUS MANANHARI (Ward).

(Plate 25, figs. 1, 1a–1i.)

Pieris mananhari, Ward, Ent. Monthly Mag. vi. p. 224 (1870); Kirby, Syn. Cat. Diurn. Lepid. p. 500 (1871); Ward, Afr. Lep. p. 2, pl. 2, Figs. 1–4 (1873).

Anthocharis flavida, Mabille, Bull. Soc. Ent. France (5), vii. p. xxxvii. (1877); Aurivillius, Rhop. Æthiopica, p. 443 (1898).

Teracolus mananhari, Saalm; Lep. Madag. 1, p. 68, pl. 3, fig. 33 (1884); Mabille, in Grandid. Hist. Madag. p. 289, pl. 39, figs. 3, 3a, 4, 4a (1885–87); Guy Marshall, P. Z. S. 1897, p. 16; Butler, Ann. and Mag. Nat. Hist. (6), xx. p. 451 (1897); Aurivillius, Rhop. Æthiopica, p. 443 (1898).

Teracolus flavidus, Mabille, *t.c.* p. 291, pl. 40, fig. 1, 1a, 2, 2a (1885).

Teracolus nothus, Mabille, *t.c.* p. 290 (1885); Aurivillius, Rhop. Æthiopica, p. 443 (1898).

WET-SEASON FORM OF MALE.—Primaries sulphur-yellow; the apical area black, commencing narrowly from about the centre of the costal margin, broadening at the apex and gradually diminishing towards the first median nervule; this black border relieved by two grey hastate spots near the apex; a minute black spot visible at the end of the discoidal cell. Secondaries entirely sulphur-yellow, with no black markings.

Underside.—Primaries pale yellow, the apical area slightly darker; the discoidal spot more strongly indicated, a second and nearly obsolete spot being visible near the apical area. Secondaries of a much deeper yellow, the usual orange costal streak being visible, but otherwise there are no spots or markings.

Expanse 2·3 inches. (*Spec. ex Morondava*; *Mus. Rothschild.*)

FEMALE.—Primaries with the central area white; a black hind-marginal border becoming broadest on the apical area and extended along the costal margin in a narrow streak, the black discoidal spot rather larger than in the male; the basal area faintly sprinkled with grey. Secondaries with the central area white, and having a broad and heavily marked black border on the hind margin.

Underside.—Primaries similar to the upper surface, the apex deep yellow, enclosed by a broad post-median black band. Secondaries deep yellow, with a faint transverse band only faintly indicated on the discal area, the orange costal streak strongly marked.

Expanse 2·4 inches. (*Spec. ex Morondava; Mus. Rothschild.*)

“INTERMEDIATE” FORM OF MALE.—Primaries similar to those of the “wet-season” form. Secondaries with a faint sprinkling of brownish grey on the hind-margin.

Underside.—Primaries with the central area pale yellow, darker on the apical area, with a narrow post-median band of black. Secondaries deep yellow, with a well-marked triangle of dark brown lines, above which a small streak of dark brown occurs from the costal margin to as far as the third median nervule.

Expanse 2·4 inches. (*Spec. ex Morondava; Mus. Rothschild.*)

“INTERMEDIATE” FORM OF THE FEMALE.—Primaries and secondaries similar to those of the “wet-season” form above described.

Underside.—Similar to the “intermediate” form of the male, the spots and markings being larger and more heavily pronounced; the triangular mark coalescing with the dark costal streak and extending to the hind-margin.

Expanse 2·3 inches. (*Spec. ex Morondava; Mus. Rothschild.*)

“DRY-SEASON” FORM OF MALE.—Very similar to that of the males above described; the black apical border somewhat narrower; the cilia tinged with reddish pink on both the primaries and secondaries.

Underside.—Central area of the primaries whitish; apical area deep sandy pink, the black discoidal spot strongly marked. Secondaries entirely deep sandy pink, sprinkled with faint brownish vermiculations, the dark triangular markings nearly obsolete.

Expanse 2 inches. (*Spec. ex Morondava; Mus. Rothschild.*)

“DRY-SEASON” FORM OF THE FEMALE.—The upper surface not differing from that of the two forms of the female previously described.

Underside.—Primaries with the central area white; the costa, apical area and hind-margin deep ochraceous-buff, followed by a post-median band of black. Secondaries entirely deep ochraceous-buff, with faint vermiculations, the hind-marginal border rather darker, and the triangular mark only slightly indicated.

Expanse 2 inches. (*Spec. ex Morondava; Mus. Rothschild.*)

HABITAT.—Madagascar. South Madagascar (*M. J. Cloisel*; *Mus. Brit.*). Fort Dauphin, January 1895 (*Hon. Reginald Walsh*; *Mus. Brit.*). Isokitraa, Diego Suarez, May and October 1891 (*E. & B. Perrot*; *Godman-Salvin Coll.*; *Mus. Brit.*). Morondava (*Mus. Rothschild*).

Mr. Guy Marshall writes:—"A very curious and somewhat isolated species peculiar to Madagascar. *Anthocharis flavida* is founded on smaller specimens in which the underside of secondaries is clouded with sandy or pinkish hatching, with a darker angulated ray or disc, and evidently represents the dry-season form. *T. nothus* is an intermediate seasonal form."

Dr. Butler's remarks are as follows:—"Ward described the wet-season form (which is largest) with almost plain yellow under surface in the male, about two black spots in the primaries and an orange costal streak to the secondaries, being the only markings on that surface; in the female the apical area of the primaries and the secondaries are buff on the under surface, the former with a sub-apical black bar representing the inner boundary of the black border of the upper surface, and a discocellular black spot, the latter often with a slender interrupted angular discal stripe. *T. nothus* is represented by two intermediate forms, which occur in both sexes. The first has the under-surface pattern of *T. mananhari* (typical), but the apex of the primaries and the secondaries are washed with rosy sienna; the second is slightly less reddish below, but has the addition of a longitudinal brown stripe through the centre of the secondaries; the female also has indications of striations on these wings. *T. flavida* is a smaller form in which the striation of the under surface appears in the male, but the angular band in that sex and the sub-apical band in the female are obsolete. Finally, there is a true dry-season form of which we possess the male only; it is small, the apex of primaries and the secondaries below fleshy buff, indistinctly striated, but without longitudinal streak or angular discal stripe.

EXPLANATION OF THE FIGURES OF *T. mananhari*.

- Plate 25, fig. 1. ♂ Morondava (*Mus. Rothschild*).
 „ 1a. Underside of fig. 1.
 „ 1b ♀ Morondava (*Mus. Rothschild*).
 „ 1c Underside of fig. 1b.
 „ 1d. ♂ Morondava (*Mus. Rothschild*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀ Morondava (*Mus. Rothschild*).
 „ 1g. ♂ Morondava (*Mus. Rothschild*).
 „ 1h. Underside of fig. 1g.
 „ 1i. ♀ Underside.

TERACOLUS INCRETUS, Butler.

(Plate 26, figs. 1, 1a-1k.)

Teracolus incretus, Butler, Ent. Monthly Mag. xviii. p. 146 (1881); *id.* P. Z. S. 1888, p. 93; Hampson, Ann. and Mag. Nat. Hist. (6) vii. p. 182 (1891); Butler, P. Z. S. 1894, p. 574; E. M. Sharpe, P. Z. S. 1894, p. 349; Butler, P. Z. S. 1896, p. 839, E. M. Sharpe in Neumann's Elephant Hunting in East Africa, App. p. 445 (1897); Guy Marshall, P. Z. S. 1897, p. 25; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 452 (1897); *id.* P. Z. S. 1898, p. 409; Aurivillius, Rhop. Æthiopica, p. 442 (1898).
Callosune vulnerata, Staud. Exot. Schmett., I. p. 46, t. 23, fig. 21 (1884).

General colour bright sulphur-yellow, the primaries with a large orange patch on the apical area, edged with black. Female similar to the male, the black markings larger and more heavily indicated.

MALE.—Primaries with the basal area bright sulphur-yellow, the apical half vivid orange, forming a large and distinct patch, with a pinkish sheen visible under certain lights; costa and hind-margin narrowly edged with black; increasing slightly in extent round the apex.

Secondaries bright sulphur-yellow, with minute black nervular dots indicated on the hind-margin.

Underside.—Primaries rather paler yellow, the apical area tinged with light orange; a faintly marked sub-apical row of brownish spots; some minute black dots, situated between the nervules, on the hind-margin. Secondaries similar to the primaries in colour, a brownish spot visible on the costal margin; a second spot at the end of the cell; a third spot between the sub-median nervure and the first median nervule; a row of minute internervular black dots on the hind-margin.

Expanse 1.7 inch. (*Spec. ex Gulu-Gulu, November 1888; F. J. Jackson.*)

FEMALE.—Primaries with the basal half pale yellow; the orange apical patch somewhat paler and crossed by a well-defined band of black from the costal margin to the inner margin, running above the sub-median nervure and between the first and second median nervules, the black being broken into large and well-marked spots. A large spot is situated at the end of the discoidal cell, and the brownish-black border on the costa, apex and hind-margin is broader than in the male. Secondaries pale sulphur-yellow with large blackish nervular spots and with a black and somewhat broken band crossing the discal area, so as almost to enclose a sub-marginal row of ovate yellow spots. A minute black dot is visible also at the end of the cell.

Underside.—Basal area of the primaries sulphur-yellow, the apical area being deeper yellow, with faint vermiculations of brown; inner margin whitish; the dark transverse band of the upper surface nearly obsolete, with the exception of a large spot between the second and third median nervules and a second spot above the sub-median nervure, the black discoidal spot large and relieved by a silver streak.

Secondaries sulphur-yellow, the discal band more broken than on the upper surface and indicated by slight brownish vermiculations which appear also on the hind-margin; at the end of the discoidal cell a distinct silvery spot encircled by a narrow line of black.

Expanse 1·7 inch. (*Spec. ex Maungu, December 1891; F. J. J.; Jackson Coll.*)

A second form of the female is very similar to the one above described, and the brownish-black markings are identical. The general colour of both wings is nearly white, and the orange patch on the apical area is only faintly indicated.

Underside.—The general colour of both primaries and secondaries is nearly white, but otherwise it is similar to that of the female fully described above as regards markings.

Expanse 1·7 inch. (*Spec. ex Teita, December 1891; F. J. Jackson.*)

“INTERMEDIATE” FORM OF MALE.—Primaries similar to those of the “wet-season” form, but with a minute dusky spot at the end of the cell. The nervular spots on the hind-margin of the secondaries only faintly indicated.

Underside.—General colour of both wings sulphur-yellow, with the sub-apical row of brownish spots more pronounced, as are also the spots on the secondaries. A nearly obsolete discal band can be seen.

Expanse 1·6 inch. (*Spec. ex Maungu, December 1891; F. J. Jackson.*)

“DRY-SEASON” FORM OF MALE.—Primaries with the basal area sulphur-yellow; the orange apical patch very bright; the apex and hind-margin narrowly edged with a black line; costal margin dusky at the base. Secondaries entirely sulphur-yellow, without any nervular spots.

Underside.—Primaries pale sulphur-yellow, the apical area tinged with orange, covered with dusky vermiculations near the apex; the sub-marginal border rather faintly indicated, the largest and most pronounced spot being situated between the second and third median nervules.

Secondaries sulphur-yellow, the basal half pinkish, with dusky vermiculations entirely covering the ground colour; the discal band indicated by a dusky spot on the costal margin; a second spot situated about the centre of the wing, and a third spot near the anal angle. A strongly marked dusky streak is also visible in the discoidal cell.

Expanse 1·7 inch. (*Kilimanjaro, F. J. Jackson; Mus. Brit.*)

“DRY-SEASON” FORM OF FEMALE.—The basal area of the primaries sulphur-yellow, with the usual orange apical patch relieved by a sub-apical row of dusky spots; three small spots near the costal margin; and a large black fourth spot, situated between the second and third median nervules, and another large black spot at the end of the discoidal cell; the apex with a dusky brown border, extending along the hind-margin, but broken up into spots at the end of the nervules, this dusky line being followed by a thin line of orange, the cilia being also dusky. Secondaries entirely sulphur-yellow, the hind-margin with small nervular spots of dusky brown; the discal band nearly obsolete, being merely indicated by a faint dusky spot at the end of the costal margin; a second spot visible between the second and third median nervules.

Underside.—Primaries sulphur-yellow, the apical area sandy-yellow, thickly sprinkled with brownish vermiculations; the sub-apical band of spots rather more strongly marked, and the discoidal spot at the end of the cell somewhat larger. Secondaries pale sandy-yellow, thickly covered with brownish vermiculations; a discal band and narrow discocellular streak slightly darker; a distinct spot of silver narrowly outlined on the lower half, visible at the end of the cell.

Expanse 1·7 inch. (*Kawembi, Nyasa Land, September 23, 1895; R. Crawshaw; Mus. Brit.*)

I have also figured (fig. 1j.) a second form of the “dry-season” female, which differs from the one above described in having the basal half of the primaries white, the blackish spots larger and the hind-marginal border darker in colour. Secondaries entirely white, the dark spots and markings more strongly indicated.

Underside.—Basal half of the primaries white, the apical area sandy-yellow, sprinkled with brownish vermiculations, the dark markings being somewhat reduced in size. Secondaries similar to those of the female above described as regards the spots and markings, but having the general colour rather more pink.

Expanse 1·8 inch. (*Kilimanjaro, F. J. Jackson; Mus. Brit.*)

HABITAT.—East Africa, from Uganda to Lamu and Kilimanjaro, and south from the Zanzibar district to Nyasa Land.

Uganda, January to June (*J. E. Baster*). Taru Desert (*C. B. Betton; Mus. Brit.*; *Butler, P. Z. S. 1898, p. 409*). Kavirondo, November and December 1889 (*F. J. J.; Jackson Coll.*). Njemps, July 1890, (*F. J. J.; Jackson Coll.*). Athi River, December 1898 (*R. C. Crawshaw; Mus. Brit.*). Machakos, June 1898 (*R. C. Crawshaw; Mus. Brit.*; *Butler, P. Z. S. 1899, p. 424*). Steppes of Thika-Shika and Ndangi River (*Dr. J. W. Gregory; Mus. Brit.*; *Butler, P. Z. S. 1894, p. 574*). Sabaki Valley (*Hampson, Ann. and Mag. Nat. Hist. (6) vii. p. 182, 1891*). Voi

River to N'di, January 1892; N'Zoi, February 1892; N'dara Hill, February 1892; Tsavo River; Maungu Hill, December 1891; Maragoyakanga, December 1891 (*J. W. Pringle*; *E. M. Sharpe*, *P. Z. S.* 1894, p. 349). Tsavo River, January 1892; Gulu-Gulu to Kibwezi, November and December 1888; Teita to Coast, December 1891; Rabai Hills, July 1889 (*F. J. J.*; *Jackson Coll.*). Lamu (*Slingsby Godfrey*; *Coll. E. M. Sharpe*). Mombasa (*Slingsby Godfrey*; *Coll. E. M. Sharpe*). Taveita Forest (*Mus. Rothschild*; *Bishop Hannington*; *Mus. Brit.*; *Butler*, *P. Z. S.* 1888, pp. 92-93). Kilimanjaro (*J. J. Jackson*; *Bishop Hannington*; *Mus. Brit.*). Ukamba (*Dr. J. W. Ansorge*; *Mus. Rothschild*). Usagara, June and August (*J. E. Baxter*). Bagamoyo (*Godman-Salvin Coll.*; *Mus. Brit.*). Mamboio (*Sir J. Kirk*; *Mus. Brit.*; Type of species).

NYASA LAND.—Kawembi, September 1895 (*R. C. Crawshay*; *Mus. Brit.*; *Butler*, *P. Z. S.* 1896, p. 839).

With this species commences an entirely new group of the genus *Teracolus*, characterised by a large apical orange patch on the primaries instead of the purple patch which distinguished the species of the preceding section. Dr. Butler described the female from Mamboio, and the male was described as *C. vulnerata* by Staudinger. Mr. Guy Marshall (*P. Z. S.* 1897, p. 26) considered *T. vulnerata* (Staud.) to be the "dry-season" form of *T. incretus*, but Dr. Butler (*Ann. and Mag. Nat. Hist.* (6) xx. p. 452 (1897), thinks that this is a mistake, as both "wet-" and "dry-" season forms are in the British Museum. The latter, he says, "is very rosy beneath, the male having the apical half and the secondaries, excepting towards the apex, fleshy sienna, transversely striated with brown and more or less spotted; there is also frequently a longitudinal dusky streak from the base through the lower half of the discoidal cell in the secondaries."

EXPLANATION OF THE FIGURES OF *T. incretus*.

(Plate 26, figs. 1. ♂ Gulu-Gulu, November 1888 (*F. J. J.*; *Jackson Coll.*).

„ 1a. Underside of fig. 1.

„ 1b. ♀ Maungu, December 1891 (*F. J. J.*; *Jackson Coll.*).

„ 1c. Underside of fig. 1b.

„ 1d. ♀ Teita, December 1891 (*F. J. J.*; *Jackson Coll.*).

„ 1e. ♂ Maungu, December 1891 (*F. J. J.*; *Jackson Coll.*).

„ 1f. ♂ Kilimanjaro (*F. J. Jackson*; *Mus. Brit.*).

„ 1g. Underside of fig. 1f.

„ 1h. ♀ Kawembi, Nyasa Land, September 23, 1895 (*R. Crawshay*; *Mus. Brit.*).

„ 1i. Underside of fig. 1h.

„ 1j. ♀ Kilimanjaro (*F. J. Jackson*; *Mus. Brit.*).

„ 1k. Underside of fig. 1j.

TERACOLUS AUXO, Lucas.

(Plate 27, figs. 1, 1a-1m.)

Anthocharis exarue, Boisd. (nec. Klug.), App. Voy. Deleg. p. 586 (1847); Trimen, Rhop. Afr. Austr. I. p. 55, n. 36 (1862).

Anthocharis auxo, Lucas, Rev. Zool. (2) vol. 4, p. 422 (1852).

Anthopsyche exarue, Wallengren, K. Sv. Vet.—Akad. Handl.; Lep. Rhop. Caffr., p. 14 (1857).

Anthopsyche eucharis, ? var., Wallengren, *t.c.*, p. 15 (1857).

Anthopsyche topha, Wallengren, Wien. Ent. Mon. 4, p. 34 (1860); *id.* Lep. Rhop. Caffr., p. 15 (1857).

Anthocharis keiskamma, Trimen, Rhop. Afr. Austr., p. 56, pl. II. figs. 3, 4 (1862-6).

Callosune topha, Wallengren, K. Sv. Vet.—Akad. Handl. p. 46, n. 7 (1872).

Callosune keiskamma, Mansel Weale, Trans. Ent. Soc. London, 1877, p. 274; Westwood in Oates's Matabele Land, App. p. 338 (1881); Staud. Exot. Schmett., i. p. 46 (1888).

Callosune auxo, Staud. Exot. Schmett., i. p. 45, t. 23, figs. 16, 17 (1888).

Teracolus auxo, Trimen, S. Afr. Butterflies, iii. p. 120 (1889); C. W. Barker, Trans. Ent. Soc. London, 1895, p. 422; Guy Marshall, P. Z. S. 1897, p. 25; *id. t.c.* 1897, p. 836; *id.* Ent. Monthly Mag. 33, p. 52 (1897); Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 452 (1897); Aurivillius, Rhop. Æthiopica, p. 442 (1898).

Teracolus topha, Trimen, S. Afr. Butterflies, iii. p. 123 (1889).

Distinguished from *T. incretus* by the distinct black line on the inner edge of the orange apical patch of the primaries. Female (yellow form) with a purplish lustre on the apical area of the primaries. Both sexes smaller than in the allied species.

MALE.—Primaries similar in colour to those of *T. incretus*, the orange apical patch enclosed by a narrow black line, which commences from the black costal margin and extends across the wing to the posterior angle. Secondaries sulphur-yellow with black nervular spots on the hind-margin.

Underside.—Primaries and secondaries not differing in colour from those of *T. incretus*, excepting that the dusky spots on the discal area are entirely absent.

Expanse 1.6 inch. (*Spec. ex Natal; Mus. Rothschild.*)

FEMALE.—Similar to that of *T. incretus* (fig. 1b) as regards markings and colour, the blackish-brown transverse line less distinct than in the male and either considerably broken up or indistinct, with (in fresh specimens) a beautiful purplish lustre over the apical area of the primaries.

Underside.—Primaries and secondaries with the ground colour slightly paler, the spots and markings otherwise similar to those of *T. incretus*.

Expanse 1.5 inch. (*Spec. ex Weenen, Natal, November 1894; Mus. Rothschild.*)

A second form of the female has the basal half of the primaries white, with a very distinct orange apical patch, crossed by a complete sub-marginal band of blackish spots.

Secondaries entirely white, the nervules terminating on the hind-margin in large blackish-brown spots, the blackish discal band being also strongly indicated.

Underside.—Similar to that of the female above described, but much paler in colour.

Expanse 1·7 inch. (*Spec. ex Natal; Godman-Salvin Coll.; Mus. Brit.*)

“INTERMEDIATE” FORM OF MALE.—Primaries similar to those of the “wet-season” form; the black apex and hind-margin much narrower, the inner black line being entirely absent. Secondaries entirely sulphur-yellow, and without any spots or markings.

Underside.—With the exception of some brownish vermiculations on the secondaries, there is no difference from the “wet-season” form of the male as regards the spots and general colour.

Expanse 1·6 inch. (*Spec. ex Natal; E. C. Buxton; Mus. Brit.*)

“INTERMEDIATE” FORM OF FEMALE.—Ground colour of both primaries and secondaries white, the spots and markings somewhat reduced in size, but otherwise like those of the “wet-season” form (fig. 1d).

Underside.—With the exception of the slight fuscous vermiculations on the apex of the primaries, as well as the secondaries, the general colour and markings are similar to those of fig. 1e.

Expanse 1·4 inch. (*Spec. ex Natal; Mus. Rothschild.*)

“DRY-SEASON” FORM OF MALE.—Basal half of the primaries pale sulphur-yellow, the apical area bright orange, narrowly edged on the costal and hind margins with dusky brown. Secondaries pale sulphur-yellow, the cilia on the anal angle and hind-margin reddish.

Underside.—Primaries with the basal area pale yellow, the apical area slightly darker and sprinkled with brownish vermiculations towards the apex. Secondaries with the basal area rosy-yellow, the marginal border pale yellow; the entire ground colour covered with brownish vermiculations; the usual discoidal streak and discal band somewhat more strongly pronounced than in *T. incretus* (fig. 1g).

Expanse 1·4 inch. (*Spec. ex Weenen, Natal; Mus. Rothschild.*)

“DRY-SEASON” FORM OF FEMALE.—Very similar to that of *T. incretus* (fig. 1h), but with the hind-marginal border somewhat darker. Secondaries with the nervular spots and the discal band larger and more heavily indicated.

Underside.—Primaries slightly darker than those of *T. incretus* (fig. 1i). Secondaries deep sandy-pink, thickly sprinkled with dusky vermiculations; the silver spot at the end of the discoidal cell very minute.

Expanse 1·5 inch. (*Spec. ex Natal; Mus. Rothschild.*)

The white form of the "dry-season" female is very similar to the one described above as regards the spots and markings; the orange apical patch is smaller, and the dark sub-apical band more united. Secondaries with the nervular spots much smaller, the discal band being entirely absent.

Underside.—Basal area white, the apical area sandy-yellow, covered with brownish vermiculations. Secondaries entirely pinkish, the basal area somewhat darker, and the whole of the ground colour thickly covered with brown vermiculations; the discal band and discoidal streak dark and well pronounced.

Expanse 1·3 inch. (*Spec. ex Natal; Mus. Rothschild.*)

HABITAT.—South-Eastern Cape Colony; Natal, north to Matabele Land.

King William's Town (*J. P. Mansel Weale*). Fort Warden, Kei River (*J. H. Bowker*). Keiskamma Hoek (*H. J. Atherstone*). Tsomo and Bashee Rivers (*J. H. Bowker*). St. John's River Mouth (*Sir H. Barkley*; Trimen, *S. Afr. Butterflies*, iii. 122-123, 1889). Natal (*Mus. Rothschild; E. C. Burton; Mus. Brit.*). Durban (*G. E. Shelley; Godman-Salvin Coll.; Mus. Brit.*). Sydenham (*C. H. Barker; Trimea Coll.*). Tugela (2500 feet, *G. A. K. Marshall; Mus. Brit.*). Verulam, Umvoti (Trimen, *S. Afr. Butterflies*, iii. p. 123, 1889). Weenen (*J. M. Hutchinson; Trimen, l.c.* p. 126, 1889; Trimen, *Mus. Rothschild*). Newcastle (*Mus. Brit.*).

ZULU LAND.—St. Lucia Bay (*Col. H. Tower; Trimen, l.c.* p. 126, 1889).

DELAGOA BAY.—Lourenço Marques (*Mrs. Monteiro; Trimen, l.c.* p. 123, 1889).

TRANSVAAL.—Limpopo and Marico Rivers (*F. C. Selous; Trimen, l.c.* p. 123, 1889). Lydenberg District (*T. Ayres; Trimen, l.c.* p. 123, 1889).

MATABELE LAND.—(*F. C. Selous; Godman-Salvin Coll.; Mus. Brit.*). Ramaqueban River, July 28, 1874 (*F. Oates; Westw. in Oates' Matabele Land*, p. 338, 1881). Tauwani River and Tchakani Vley (*F. C. Selous; Trimen, l.c.* p. 123, 1889).

This is the southern representative of *T. incretus*. It would seem to be a common insect in the eastern districts of the Cape Colony.

T. auro is the "wet-season" form, and *T. topha* (= *T. keiskamma*) the "dry-season" forms.

Dr. Trimen, in describing *T. keiskamma* (*Rhop. Austr.* p. 58), publishes the following note:—"This very beautiful and distinct species of *Anthocharis* was first discovered in British Kaffraria, in the month of September 1860, by Mr. D'Urban, who kindly forwarded me specimens of both sexes, from which my description has been made. The following restricted localities of capture seem to afford sufficient reason for the name proposed by Mr. D'Urban for this species. "Very abundant at Kingscote, near Bodiam, on the Keiskamma, about five miles from the sea, and as far as the Chalumma." "At the end of November, at Line Drift on the

Keiskamma, I saw this butterfly in the greatest profusion near the river; but only a few stragglers were seen a mile or so beyond, and none anywhere else; though I have just come off a ride of about 120 miles in four days, having visited the following places, viz., Tamacha, Line Drift, Breakfast Vley, Alice, Middle Drift, and Fort White." Mr. D'Urban also found the insect abundant in the Fish River Bush, and informed Dr. Trimen that Captain Colley, 2nd Queen's, reported its occurring abundantly in a Kloof on the Tninika, a tributary of the Kei.

Dr. Butler writes:—"The yellow form of this species appears to be strictly confined to Kaffraria and Natal, but a somewhat paler race occurs in Matabele Land. The extreme types *T. auxo* and *T. keishamma* were proved by Mr. Mansel Weale, and recently by Mr. Guy Marshall, to be 'wet-' and 'dry-' season forms of one species; *T. topha*, which is usually regarded as identical with *T. keiskamma*, appears to be an intergrade of which we possess six examples in the Museum."

"Of the Matabele Land type, which only differs in its somewhat whiter coloration, we only possess males of the 'wet' and 'intermediate' forms." Mr. Mansel Weale (Transactions of the Entomological Society, 1877, p. 273) writes as follows:—"In Mr. Trimen's Rhop. Afr. Austr., vol. i., is described *Anthocharis* (*Callosune*) *keiskamma*, Trimen, a species there noticed as not improbably capable of being classed as a sub-species of *C. evarne*. Both of these butterflies I have often seen in the neighbourhood of the Keiskamma River, the former being especially abundant; in fact, the whole valley of the Keiskamma is peculiarly prolific in *Callosunes*. During the last three years I have been staying about three miles from King William's Town in the valley of the Yellowwoods, and I was much struck by the abundance of *C. keiskamma* near a small group of bushes from January to May 1876, especially so, as I had not met with the insect in the neighbourhood before. The spot in question is about fifteen miles in a direct line from the Keiskamma with high ground intervening. I captured that season about twenty or thirty of both sexes, and wishing to discover the food-plant I noticed that the butterflies especially frequented a bush which I had not before noticed. This proved to be *Cadaba natalensis* (*Capparidex*), not hitherto, I believe, reported from the south of Natal. The females deposited their small, fluted, orange-coloured eggs singly on the summit of the flower-buds. A chrysalis was also found on one of the outer branches of a bright-green colour, and it proved to be that of *C. keiskamma*. The larva, when first hatched, is of a bright-orange colour, and penetrates the bud, where it passes its first stage. It afterwards assumes a dull bluish-green colour with lateral stripes of a paler colour: these assimilate it to the pellucid margins of the small leaves of the plant, whose general colour it resembles. The younger caterpillars of *Eronia cleodora* closely resemble the mature larva of *C. keiskamma*, but are more brightly coloured, in harmony with the foliage of *Capparis*

zeyheri, one of its food-plants. Most of my larvæ of *C. keiskamma* were procured by beating, as it was most difficult to detect them on the shrub. In raising chrysalids I was particularly struck by the variations of their colour under different conditions. These variations were not, however, followed by any marked differences in the colour and form of the imagines.

“About this time I regret to say that I gave away most of my specimens of this species to a Mr. Bailey, of Port Elizabeth, under the impression that I could at any time replace them, and being engaged in some other work, I neglected to collect this species until the end of 1876. To my great surprise, I found every insect captured on the bush proved to be not *C. keiskamma*, but *C. evarne*, which I had also not noted in the neighbourhood before. Owing to the dryness of the season, these, however, were scarce, and it was some time before I had an opportunity of watching the females laying their eggs or of collecting the larvæ. By daily watching the bush I had, before leaving in April last, succeeded in collecting several, which were exactly similar to the larvæ obtained in the previous autumn. I also saw the female *C. evarne* laying her eggs in precisely the same manner as did the female of *C. keiskamma*. The eggs in like manner did not differ; and not merely were the pupæ the same in shape and markings, but they presented the same liability to vary in colour as did those of *C. keiskamma*.

“Up to the end of April last I never saw another specimen of *C. keiskamma*, although the specimens of *C. evarne* round the bush in question were numerous. I think this a most curious case, because, although the two insects closely resemble each other, the differences relate not merely to the colour of both wings on both surfaces and in both sexes, but also to form.

“Considering how closely many of the so-called species of this group resemble each other, and how extremely variable are even the forms collected in a single locality, I think that an instance such as this should make naturalists pause before multiplying its nomenclature. Although I am disposed to think that more careful observation will show that this is not an isolated instance in the *Pierina* group, it certainly would seem contradictory to the axiom ‘*Natura non facit saltum*.’

“I may remark that individuals of both forms vary much, but in none of the instances collected by me do they show any tendency to vary in the direction of the other form.

“From what I have noticed in some other *Pieridæ*, I am inclined to think that the yellow coloration to which some species are peculiarly subject depends in some way or other on the dryness of the season. Specimens of *P. severina* and *P. mesentina* (females) collected in dry seasons in moist localities or in dry districts are generally deeply coloured.

"With reference to the changes in the colour of pupæ, I believe a very wide field of research is open, and with the improved modes of microscopical examination under the spectroscope important revelations on the subject of variation will be discovered.

"I here give the results of some very rude experiments on this subject.

"Most of the specimens were reared in glass test tubes exposed on coloured cards, in which they were partially enveloped. They were constantly supplied with as little food as possible, in order that their full exposure to the colour should not be interfered with.

"PUPÆ OF *C. keiskamma*.

"(1) On dead leaves away from light. Dark brown.

"(2) On stem and on vermilion cards. Pale ochreous.

"(3) On vermilion card. Pale bluish-green.

"(4) Exposed on bush in nature and on yellow-gamboge cards. Bright green.

"(5) On glass tumbler. Pale yellowish-green.

"(6) On green (cobalt and gamboge). Ochreous.

"(7) On cobalt-blue. Greenish-white."

Mr. Guy Marshall (The Entomologists' Monthly Magazine, vol. viii. p. 52, 1897) gives his experience of the rearing of *T. auxo* from the eggs laid by *T. topha*: "On October 27th I observed a female of typical *T. topha* flying round a straggling shrub (one of the *Capparidæ*), on which I saw her deposit four eggs. These were at first of a light yellow colour, but became pink afterwards; they were of the usual *Pierid* shape—elongate, subfusiform, and fluted longitudinally. On the 30th three larvæ hatched out, one of the eggs being infertile. The description of the full-grown larva and pupa is as follows:—

"*Larva*.—Uniform pea-green, with a narrow yellow lateral line, which does not extend on to the thoracic segments. Upper surface smooth, with no trace of hairs or tubercles.

"*Pupa*.—General shape not unlike that of *T. pleione*, Kl. (P. Z. S. 1896, pl. X. fig. 18), but decidedly more slender and the wing-covers rather less prominent. Its most distinct feature is the long cephalic horn, which is nearly as long as the thorax, and curves slightly backwards. Colouring adaptive, varying from pale pinkish-sandy with darker mottling through every shade to uniform pale green. The brown tints, however, predominate, even when the pupæ are attached to the leaves of the food-plant, being probably influenced by the brown stems of the shrub, as the only pure green pupæ I ever obtained were from larvæ which pupated when the supply of food-plant happened to consist only of young twigs which were entirely green.

"The development of these larvæ was very rapid, the larval stage occupying only twelve days in two instances, and thirteen in the third; the pupal stage in all cases occupied eight days, thus making twenty-three days from the laying of the egg to the emergence of the perfect insect. Two of the specimens emerged on November 19th, and the third on the 20th, all of them being undoubted males of *T. auxo*, Lucas; thus definitely proving that *T. topha* is only a seasonal form of that species. It is perhaps worth noting that, although the larvæ were reared under precisely similar conditions, the imagos differed somewhat in the development of the black markings on the upper side. The two earlier specimens had the hind-marginal border in the fore-wings comparatively narrow, and had no sign of black along the inner edge of apical patch. This is the early 'wet-season' form. The third example, however, had the border slightly broader and more thickened towards the posterior angle, and also exhibited a trace of black scaling along the inner edge of the patch, thus showing an approach to the more heavily marked full 'wet-season' form. Although I am of opinion that the augmentation of the upperside black markings in *Teracolus* is probably due directly to climatic causes—as opposed to the protective action of natural selection, which has probably influenced the underside coloration—yet in this particular instance the cause of the difference in the specimens is by no means apparent, as they were reared under absolutely identical conditions, and I certainly hesitate to attribute it to the fact that one of them was a day longer in the larval stage."

EXPLANATION OF THE FIGURES OF *T. auxo*.

- Plate 27, fig. 1. ♂ Natal (*Mus. Rothschild*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Weenen, Natal (*Mus. Rothschild*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀ Natal (*Godman-Salvin Coll.*; *Mus. Brit.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♂ Natal (*E. C. Burton*; *Mus. Brit.*).
 „ 1g. ♀ Natal (*Mus. Rothschild*).
 „ 1h. ♂ Weenen, Natal (*Mus. Rothschild*).
 „ 1i. Underside of fig. 1h.
 „ 1j. ♀ Natal (*Mus. Rothschild*).
 „ 1k. Underside of fig. 1j.
 „ 1l. ♀ Natal (*Mus. Rothschild*).
 „ 1m. Underside of fig. 1l.

TERACOLUS DISSOCIATUS, Butler.

(Plate 28, figs. 1, 1a-1j.)

Teracolus dissociatus, Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 453 (1897).*Teracolus auxo*, var *dissociatus*, Aurivillius (part), Rhop. Æthiopica, p. 442 (1898).

Allied to *T. auxo*, but larger, and distinguished by the white central area of both primaries and secondaries. The black markings are also somewhat more heavily indicated.

MALE.—Very similar to the male of *T. auxo*, but with the basal area of the primaries whiter in colour; the apex, hind-margin, as well as the inner black line, inclosing the orange apical patch, much more strongly marked than in *T. auxo*. Secondaries paler than in the allied species, with dusky nervular spots on the hind-margin.

Underside.—Similar as regards markings to the female of *T. auxo*, but the inner margin on the primaries is white. The black spot at the end of the discoidal cell of the secondaries is very distinct.

Expanse 1·6 inch. (*Spec. ex Lake Nyasa; Godman-Salvin Coll.; Mus. Brit.: Type of species.*)

FEMALE.—Primaries similar to those of *T. auxo*, but whiter; the black marginal border broader and the spots strongly indicated, with the sub-marginal line of black spots entirely disconnected. Secondaries not different from those of *T. auxo*.

Underside.—Primaries pale sulphur-yellow, white on the inner margin; the black spot at the end of the discoidal cell somewhat larger; the sub-marginal row of black spots indicated merely by two faint spots near the costal margin, with a second still larger spot between the second and third median nervules, while a third and final spot is situated between the sub-median nervure and the first median nervule. Secondaries deeper in colour, the usual dusky band which traverses the discal area being only faintly pronounced, with a greenish shading on the hind margin.

Expanse 1·6 inch. (*Spec. ex Lake Nyasa; Godman-Salvin Coll.; Mus. Brit.*)

“INTERMEDIATE” FORM OF MALE.—Primaries somewhat paler than in the typical form, the inner line of black enclosing the orange patch being almost absent, while the black on the apex and hind-margin is decidedly narrower. Secondaries with the nervular spots on the hind margin nearly obsolete.

Underside.—Not different from that of the “wet-season” form described above.

Expanse 1·4 inch. (*Spec. ex Likoma; E. M. de Jersey; Mus. Brit.*)

"INTERMEDIATE" FORM OF FEMALE. (Description of a worn specimen in the British Museum). The orange apical patch slightly larger, the inner black line being entirely absent; the hind-margin not so broad nor so heavily marked; the black sub-marginal border which crosses the orange patch only faintly indicated by three dark spots, the largest being situated between the second and third median nervules, the other two spots close to the costal margin. Secondaries white, with faint nervular spots on the hind-margin.

Underside.—Central area of primaries white, the apical area thickly covered with brownish vermiculations and the characteristic spots being clearly in evidence. Secondaries thickly covered with brownish vermiculations; a distinct silver spot visible about the middle of the discoidal cell.

Expanse 1.4 inch. (*Spec. ex Victoria Nyanza; G. F. Scott-Elliot; Mus. Brit.*)

"DRY-SEASON" FORM OF MALE.—Excepting that the general colour of both the primaries and the secondaries are white, this phase does not differ from the "dry-season" form of *T. auxo* as regards its upper surface.

Underside.—Somewhat paler in colour as regards the spots and markings, but otherwise agreeing with those of *T. auxo*.

Expanse 1.5 inch. (*Spec. ex Lake Nyasa; Godman-Salvin Coll.; Mus. Brit.*)

"DRY-SEASON" FORM OF FEMALE.—Very similar to the same phase of *T. auxo*, but with the sub-marginal row of black spots on the primaries more distinctly indicated. Secondaries also not different in colour, excepting that the second spot (between the second and third median nervule) is absent.

Underside.—Primaries pale sulphur-yellow, the apex showing brown vermiculations and having the sub-marginal band well marked. Secondaries entirely covered with brownish vermiculations; the discal band strongly indicated.

Expanse 1.4 inch. (*Takanugu, British East Africa; R. Crawshay; Mus. Brit.*)

I have also figured the underside of a second form of the "dry-season" female which agrees with the yellow form above described as regards the spots and markings. The general colour, however, is white, with the brownish black border on the apex and hind-margin more united. The underside only differs in that the general aspect is white and the dark spots on the primaries are rather more faintly indicated.

Expanse 1.4 inch. (*Spec. ex Kilimanjaro; F. J. Jackson; Mus. Brit.*)

HABITAT.—Nyasa Land to Kilimanjaro and the Victoria Nyanza

Lake Nyasa (*Godman-Salvin Coll.; Mus. Brit.*). Likoma, May 1899 (*E. M. de Jersey; Mus. Brit.*). Kilimanjaro (*F. J. Jackson; Mus. Brit.*). Takanugu (*R. Crawshay; Mus. Brit.*). Victoria Nyanza (*G. F. Scott-Elliot; Mus. Brit.*).

Professor Aurivillius doubts whether this form is really different from *Teracolus auxo*. It is certainly a question whether it is really separable, but I have described

and figured the typical specimens in the British Museum, and it must be left to future research in the field to discover the exact relations between these two species.

EXPLANATION OF THE FIGURES OF *T. dissociatus*.

- Plate 28, fig. 1. ♂ Lake Nyasa (*Godman-Salvin Coll.*; *Mus. Brit. type*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Lake Nyasa (*Godman-Salvin Coll.*; *Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Likoma (*E. M. de Jersey*; *Mus. Brit.*).⁴
 „ 1e. ♀ Victoria Nyanza (*G. F. Scott-Elliot*; *Mus. Brit.*).
 „ 1f. Underside of fig. 1e.
 „ 1g. ♂ Lake Nyasa (*Godman-Salvin Coll.*; *Mus. Brit.*).
 „ 1h. Underside of fig. 1g.
 „ 1i. ♀ Takanugu, December 5, 1897 (*R. Crawshaw*; *Mus. Brit.*).
 „ 1j. Underside of white variety. Kilimanjaro (*F. J. Jackson*; *Mus. Brit.*).

TERACOLUS EVARNE, Klug.

(Plate 29, fig. 1, 1a-11.)

Pontia evarne, Klug. *Symb. Phys. pl. vi. figs. 1-4* (1829).

Pontia liagore, Klug. *t.c. figs. 5-8* (1829).

Anthocharis evarne, Lucas, *Lep. Ex. pl. 37, fig. 3* (1835); *Boisd. Sp. Gen. I. p. 569, no. 15* (1836);

Trimen, Rhop. Afr. Austr. p. 55, no. 36 (1862).

Anthocharis liagore, *Boisd. t.c. I. p. 580, no. 33* (1836).

Callosune evarne, Kirby, *Syn. Cat. Diurn. Lepid. p. 501* (1871).

Callosune liagore, Kirby, *t.c. p. 503* (1871).

Teracolus citreus, Butler, *P. Z. S. 1876, p. 152, no. 120*; *id. P. Z. S. 1888, p. 92*; *id. P. Z. S. 1894, p. 575*; *E. M. Sharpe, P. Z. S. 1896, p. 536*.

Teracolus syrtinus, Butler, *P. Z. S. 1876, p. 163, no. 124*; *id. P. Z. S. 1894, p. 574*; *Guy Marshall P. Z. S. 1897, p. 25 (part)*.

Teracolus xanthevarne, Butler, *P. Z. S. 1876, p. 163, no. 123*.

Callosune citreus, Kirby, *Syn. Cat. Diurn. Lepid. Suppl. p. 803* (1877).

Callosune syrtinus, Kirby, *t.c. Suppl. p. 805* (1877).

Callosune xanthevarne, Kirby, *t.c. Suppl. p. 805* (1877).

Teracolus evarne, Butler, *P. Z. S. 1888, p. 75*; *Guy Marshall, P. Z. S. 1897, p. 26*; *Butler, P. Z. S. 1897, p. 693*; *id. Ann. and Mag. Nat. Hist. (6) xx. p. 453* (1897); *id. P. Z. S. 1898, p. 409*

Aurivillius, Rhop. Æthiopica, p. 441 (1898).

Teracolus liagore, *Guy Marshall, P. Z. S. 1897, p. 25*; *E. M. Sharpe, P. Z. S. 1897, p. 776*.

Distinguished from *T. auxo* and *T. dissociatus* by the absence of the black line on the inner side of the orange patch of the primaries. The female has the orange

patch on the primaries more suffused and, in some specimens, almost hidden by a shading of dusky brown.

MALE.—Central area of the primaries almost white; the orange apical patch somewhat larger than in the allied species, and enclosed on the inner side by a band of pale yellow; the costa, apex, and hind-margin narrowly edged with black. *Secondaries* entirely creamy-white, the nervules terminating on the hind-margin in faint dusky spots.

Underside.—Primaries whitish, the apical area tinged with orange, three very minute dusky spots being visible between the sub-costal nervules; base of wing greenish. *Secondaries* entirely pearly-white, with the usual minute black disco-cellular spot.

Expanse 1·6 inch. (*Spec. ex Tsavo River, January 1892; Jackson Coll.*)

FEMALE.—Primaries with the discal area pale yellow; basal area dusky grey; apex and hind-margin brownish as far as the first median nervule, the orange apical patch crossed by a median line of brown markings; two additional brownish spots strongly pronounced, one situated at the end of the cell, with a second spot in the white area towards the posterior angle. *Secondaries* pale yellow, rather dusky at the base; the brownish nervular spots on the hind-margin large, and the discal row of spots decidedly distinct, but not connected.

Underside.—Primaries pale yellow, somewhat deeper in colour at the base; three silver spots encircled with orange indicating the dark median line of the upper surface; the cellular and posterior spots also reproduced on the under-surface. *Secondaries* whitish, the hind-margin with a yellow shade, the discal band much broken up.

Expanse 1·4 inches. (*Spec. ex Athara River; Mus. Brit.*)

WHITE FORM OF FEMALE.—The orange patch only faintly indicated, the whole of the primaries being suffused with smoky-brown. *Secondaries* pearly-white, the spots and markings similar to those of the female above described.

Underside.—Primaries white, the base greenish-yellow; apical area pale yellow, with faint vermiculations of brown; the median band similar to that of the yellow form of the female above described. *Secondaries* white, the discoidal spot and discal band dusky-brown, with a slight shading of the same colour also visible on the hind-margin and at the base of the wing.

Expanse 1·5 inches. (*Spec. ex Athara River; Mus. Brit.*)

“INTERMEDIATE” FORM OF MALE.—The orange patch on the primaries somewhat larger than in the typical form, with a broad inner line of sulphur-yellow; basal area pale yellow, dusted with grey; the black hind-marginal border very narrow. *Secondaries* pale yellow, with distinct nervular-spots of brown on the hind-margin.

Underside.—General colour of both wings sulphur-yellow, with a dusky spot on the primaries near the costal margin. *Secondaries* similar to those of *T. auxo*.

Expanse 1·4 inches. (*Spec. ex Atbara River; Mus. Brit.*)

Dr. Butler has separated a second phase of the male (fig. 1h), which he considers to be an "intermediate" form. This form represents *T. xanthevarne*, and is somewhat similar to the "wet-season" type (fig. 1), the black on the costal and hind margins being much narrower and the general colour much deeper yellow.

"INTERMEDIATE" FORM OF FEMALE.—Central area of the primaries white; the black transverse median row of spots on the orange area somewhat reduced in size; a distinct dusting of grey at the base of the wing; the usual discoidal spot very minute. *Secondaries* white, with black nervular spots on the hind-margin; the discal band marked by two dark spots, varying in size, near the costal margin, a third spot being present between the second and first median nervules.

Underside.—Excepting that the spots are smaller, this phase agrees with the "wet-season" form of the female (fig. 1c.)

Expanse 1·4 inches. (*Spec. ex Podia, Ungaro, April 9, 1897; Dr. J. W. Ansorge; Mus. Rothschild.*)

A second form of the "intermediate" female has the sulphur-yellow area of the primaries rather larger, the spots and markings being very similar to those of the "wet-season" female (fig. 1b).

Underside.—Central area white; apical area pale yellow, with brownish vermiculations; base and cell greenish-yellow, with a slight dusting of brown. *Secondaries* whitish, thickly covered with dusky vermiculations, the spots and markings similar to those of the female (fig. 1e).

Expanse 1·5 inches. (*Spec. ex Teita, May 1891; Mus. Rothschild.*)

"DRY-SEASON" FORM OF MALE.—Primaries almost white, the orange patch somewhat reduced in size, the black on the apex and hind-margin being nearly obsolete. *Secondaries* entirely white, without any spots or markings.

Underside.—Primaries white, the apical area sandy-yellow, with two brownish spots faintly indicated near the costal margin. *Secondaries* entirely sandy-pink, without any spots or markings.

Expanse 1·4 inch. (*Spec. ex Turquet, January 1890; Jackson Coll.*)

"DRY-SEASON" FORM OF FEMALE.—Central area of the primaries white; the orange patch somewhat more reddish in colour, but more reduced than in *T. dissociatus* (fig. 1i); the distribution of the spots similar. *Secondaries* white, but otherwise agreeing with those of *T. dissociatus*.

Underside.—Central area of the primaries white; base of wing greenish-yellow.

Secondaries entirely sandy-pink, the spots and markings agreeing with those of the female of *T. dissociatus* (fig. 1j).

Expanse 1.4 inch. (*Spec. ex Melindi, October 1891; Mus. Rothschild.*)

HABITAT.—From the neighbourhood of Suakim in the Red Sea to Equatorial Africa, and East Africa as far south as Nyasa Land. Said also to occur in Senegambia.

NORTH EAST AFRICA.—Halaib, near Suakim, Red Sea, January; Shelal Mountain, near Suakim, January 28, 1896 (*A. J. Chalmley; E. M. Sharpe, P. Z. S. 1897, p. 776, No. 19*). White Nile (*Mus. Brit.*). Atbara River (*Mus. Brit.*). Salomona, Erythræa, November and December, 1897 (*Schrader; Mus. Rothschild*). Anseba Valley (*W. Jessc; Godman-Salvin Coll.; Mus. Brit.*). Waliko (*W. Jessc; Godman-Salvin Coll.; Mus. Brit.*).

SOMALI LAND.—Arusa Galla Country (*F. Gillett; Mus. Brit.; Butler, P. Z. S. 1897, p. 693*). Upper Shebeli River; Sheik Husein; Sheik Mahomed, September (*Dr. Donaldson Smith; Mus. Rothschild*). Hargeisa, July 18; Stony-brook, August 29; Meo, October 25 (*Dr. Donaldson Smith; E. M. Sharpe, P. Z. S. 1896, p. 536*).

EQUATORIAL AFRICA.—Wadelai, January and March 1887 (*Emin Pasha; Mus. Brit.; Butler, P. Z. S. 1888, p. 75*).

EAST AFRICA.—Njemps, Ngatana, Kikuyu, Kedong, Newà, and shores of Lake Baringo (*J. W. Gregory; Mus. Brit.; Butler, P. Z. S. 1894, p. 575*). Elgeyo, July; Kavirondo, November and December; Turquel, January (*F. J. J.; Jackson Coll.*). Kinani (*J. W. Gregory; Mus. Brit.; Butler, P. Z. S. 1894, p. 575*). Kilimanjaro (*F. J. Jackson; Mus. Brit.; Butler, P. Z. S. 1888, p. 92*). Podia, Unyoro, April, May, August (*Dr. J. W. Ansorge; Mus. Rothschild*). Witu, Melindi, October; Mombasa (*Mus. Rothschild*). Coast to Teita, December; Gulu-Gulu to Kibwezi, November and December; Kibwezi, December (*F. J. J.; Jackson Coll.*). Bagamoyo (*Godman-Salvin Coll.; Mus. Brit.*). Mamboio (*Dr. Wilson Barker; Mus. Brit.*).

NYASA LAND.—Takarugu (*R. Crawshay; Mus. Brit.*).

This species is a very well-marked form of the *T. auvo* group, and is distinguished, as Mr. Guy Marshall has pointed out, by the more rounded shape of the fore-wings. Its range is well defined as regards North Eastern and Eastern Africa, and it is quite probable that it may ultimately be found to extend throughout the Sudan to Senegambia. At present the evidence for this extension of its western range rests upon a couple of specimens in the British Museum, one labelled "Senegal," and the other "West Africa" (*Sir Gilbert Carter*).

As regards the different phases, Mr. Guy Marshall writes:—" *T. xanthevarne* represents the fullest development of the wet-season form, and approaches *T. incertus*; typical *T. evarne* is a little less strongly marked; the specimens placed with *T. sytinus*

in the British Museum constitute an exactly intermediate seasonal form ; and *T. citreus* is the full dry-season form."

This I thoroughly agree with, but when he says that "*T. phillipsii* is founded on dwarfed specimens from the Somali deserts," I must decidedly differ from him. He also keeps *T. liagore* as a distinct species allied to *T. ephyia*, but here again I have followed Dr. Butler, who considers that *T. liagore* is only a phase of *T. evarne*.

As regards *T. evarne* from Wadelai (P. Z. S. 1888, p. 75) Dr. Butler makes the following remarks :—"There are evidently large and small forms of this species, as in the allied *T. phillipsii* from Somaliland ; hitherto we have received male examples equal in size to that figured by Klug ; the male now received is much smaller and has lost the marginal spots on secondaries. On the other hand, the female figured by Klug is small and evidently belongs to our small male, whilst the female just received is large and heavily marked, and belongs to Klug's male. It is probable that the small type is the winter form of the species ; but, after all, conjectures are valueless in these questions."

In "A Revision of the Genus *Teracolus*," (Ann. and Mag. Nat. Hist. 69 xx., p. 453, 1897), Dr. Butler writes :—"One of the most widely distributed and variable species of its group, ranging from Upper Egypt and the White Nile to Abyssinia, southwards to the Albert Nyanza, the Victoria Nyanza, and Kilimanjaro, and eastwards to Mombasa. On the western side it appears to be rare, but we have one example (the type of *T. syrtinus*), said to be from 'Senegal,' and a second recorded as simply from 'West Africa.' In ground colour *T. evarne* varies from primrose-yellow to white, the typical form being almost white with yellow diffused bordering to the orange apical area ; this is the wet-season form of the species and the most heavily marked with black. *T. xanthevarne* appears to be the prevalent form of the species in Upper Egypt, the White Nile, and Abyssinia, and chiefly differs in its inferior size, yellower colouring, and frequently in the larger orange patch on the primaries. *T. syrtinus* is an intermediate-season form, which apparently ranges westwards from Mombasa through the Sabaki Valley, past Kilimanjaro and the Victoria Nyanza to Wadelai, and thence across the continent to Senegal, where it varies slightly from the normal form, the lower extremity of the orange apical patch being indistinctly bordered with blackish, so as vaguely to resemble the wet-season form of *T. auro* (nobody, however, with an eye for species could calmly compare the two and for a moment regard them as identical). The males of this form never have the margin of the secondaries dotted, and on the under surface they show a slight tendency to rosy tinting. The females are altogether more lightly marked than those of typical *T. evarne*. *T. liagore* is probably little more than a rare starred albinism occurring in Egypt and on the borders of the Red Sea ; in its weak markings it would

seem to be a dry-season form, but the colouring of the under surface is that of the wet-season. I should look upon it as an intermediate form, probably occurring just before the rains. *T. citreus* is the dry-season form occurring with typical *T. evarne* but smaller, much more lightly marked above, and very rosy below."

EXPLANATION OF THE FIGURES OF *T. evarne*.

- Plate 29, fig. 1. ♂ Tsavo River, January 1892 (*Jackson Coll.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Atbara River (*Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀ Atbara River (*Mus. Brit.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀ Podia, Unyoro, April 9, 1897 (*Dr. J. W. Ansorge ; Mus. Rothschild*).
 „ 1g. Underside of fig. 1f.
 „ 1h. ♂ Atbara River (*Mus. Brit. ; T. xanthovarne* form).
 „ 1i. ♂ Turquel, January 1890 (*Jackson Coll.*).
 „ 1j. Underside of fig. 1i.
 „ 1k. ♀ Melindi, October 1891 (*Mus. Rothschild*).
 „ 1l. Underside of fig. 1k.

TERACOLUS PHILLIPSII, Butler.

(Plate 30, Figs. 1, 1a, -1g).

Teracolus phillipsii, Butler, P. Z. S. 1885, p. 772, pl. xlvii. fig. 11; *id.* P. Z. S. 1896, pp. 246, 253; E. M. Sharpe, P. Z. S. 1896, p. 536, no. 24; *id.* P. Z. S. 1896, p. 528, no. 59; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 454 (1897); Dixey, P. Z. S. 1900, p. 15.

Teracolus evarne (part) Guy Marshall, P. Z. S. 1897, p. 26; Aurivillius, Rhop. Æthiopica, p. 442 (1898).

Very similar to *T. evarne*, but at once distinguished by its smaller size, the black on the hind-margin and apex being extremely narrow, and the median line of sulphur-yellow almost obsolete.

MALE.—Central area of the primaries white; the apical half bright orange, edged on the inner side by a faint line of sulphur-yellow. Costa, apex, and hind-margin narrowly edged with black to as far as the first median nervule. *Secondaries* entirely white without any spots or markings.

Underside.—Primaries white, the apical area tinged with yellow; three dusky

spots near the costal margin situated between the sub-costal nervules; some minute black dots visible between the nervules on the hind margin. *Secondaries* whitish, the minute inter-nervular black dots being visible on the hind-margin, as well as a tiny black dot at the end of the discoidal cell.

Expanse 1·4 inch. (*Spec. ex Somali Land; J. G. Thrupp; Mus. Brit.*).

FEMALE.—Central area pale yellow, the orange apical patch crossed by a post-median band of distinct brownish-black spots; the brownish hind-marginal border rather well defined, but not beyond the first median nervule; a dusky spot visible at the end of the cell, followed by a second and larger spot on the inner margin towards the posterior angle; the basal area dusky green. *Secondaries* creamy-white, the nervules terminating in well-defined dusky spots on the hind margin; three dusky spots near the costal margin indicating a faint brown discal band.

Underside.—Very similar to that of *T. evarne*, the ground colour of the secondaries covered with faint sprinklings of brownish-yellow.

Expanse 1·3 inches. (*Spec. ex Somali Land; J. G. Thrupp; Mus. Brit.*).

No "intermediate" forms have as yet been discovered.

"DRY-SEASON" FORM OF MALE.—Central area pale yellowish-white; the orange patch bright and well-defined; the black on the apex and hind-margin absent. *Secondaries* entirely pale yellowish-white; no spots or markings visible.

Underside.—Central area of the primaries white; with the apical area pale yellow; the three marginal spots only faintly indicated. *Secondaries*. General colour sandy-pink, with a minute brownish speck visible at the end of the cell.

Expanse 1·1 inch. (*Spec. ex Somali Land; J. G. Thrupp; Mus. Brit.*).

"DRY-SEASON" FORM OF FEMALE.—Central area of the primaries white, but the orange patch paler in colour, and the post-median band of dusky spots much reduced in size and not so strongly pronounced; the spots on the post-median band disconnected and showing three small spots near the costal margin, the last and largest spot situated between the second and third median nervules; the hind-marginal border indicated by small dusky brown nervular spots; the brownish spot near the posterior angle less strongly marked than in the "wet-season" form. *Secondaries* entirely white.

Underside.—Central area of the primaries white, the yellow apical patch sprinkled with brownish vermiculations, the post-median transverse line of spots well defined. *Secondaries* sandy-pink, covered with brownish sprinklings; a brownish band visible on the discal area.

Expanse 1·2 inch. (*Spec. ex Somali Land; J. G. Thrupp; Mus. Brit.*).

HABITAT.—Somali Land.

SOMALI LAND.—(*J. G. Thrupp; Mus. Brit.*;) Butler, P. Z. S. 1885, p. 772, pl. xlvii. fig. 11). Bichen, January 22, 1897 (*F. Gillett; Mus. Brit.*). Gellokur,

February 9, 1895 (*Mrs. E. Lort-Phillips*; E. M. Sharpe; P. Z. S. 1896, p. 528). Haud District, July 4, 1897; Edegan, July 9, 1897; Odewein, June 21, 1897; Hargeisa, April 25–28, 1895; (*C. V. A. Peel*; Dixey; P. Z. S. 1900, p. 15); Ahdeh, July 17, 1895; Sheik Husein, September 19–October 1, 1895 (*Dr. Donaldson Smith*; E. M. Sharpe, P. Z. S. 1896, p. 536).

This species of *Teracolus*, as far as my evidence goes, seems to be confined to Somali Land. It appears to be a small race of *T. evarne*, but with characteristics sufficient, I think, to distinguish it from that species, though it has been united to *T. evarne* by Mr. Guy Marshall in his "Monograph." He observes: "*T. phillipsii* is founded on dwarfed specimens; it shows an unbroken gradation into the typical form."

Dr. Butler, on the other hand, considers it to be worthy of specific distinction, and he writes as follows: "This is a well-defined local representative of *T. evarne* most nearly approaching the varietal form *T. liagore* in character. In all its seasonal phases it is much more lightly marked and paler in colouring than *T. evarne*, as well as slightly smaller than in the corresponding phases of *T. evarne*. The ground colouring is always white, with the pale orange apical patch very faintly tinted with yellow along the inner edge; the marginal bordering, even of the wet season male, is comparatively weak, while the secondaries are always unspotted. The female in the wet-season has the upper surface marked almost as in the dry-season female of *T. evarne*, while the intermediate type, which is smaller, has the female still less marked above and striated below with greenish-olive; the dry-season form is very small, the male without marginal markings, the female very faintly marked, but both sexes rosy and more or less striated below."

EXPLANATION OF THE FIGURES OF *T. phillipsii*.

- Plate 30, fig. 1. ♂ Somali Land (*J. G. Thrupp*; *Mus. Brit.*; *Type*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Somali Land (*J. G. Thrupp*; *Mus. Brit.*; *Type*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Somali Land (*J. G. Thrupp*; *Mus. Brit.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀ Somali Land (*J. G. Thrupp*; *Mus. Brit.*).
 „ 1g. Underside of fig. 1f.

TERACOLUS EUCHARIS, (Fabr.)

(Plate 31, figs. 1, 1a–1m.)

Papilio eucharis, Fabricius, Syst. Ent. p. 472 (1875).

Papilio aurora, Cramer, Pap. Exot. iv. pl. cxcix, figs. A. B. (1872).

Euchloe cornis, Hübner, Verz. Vek. Schmett. p. 94 (1816).

Pieris tilea, Godart, Ent. Méth. ix. p. 124 (1819).

Teracolus eucharis, Butler, P. Z. S. 1876, p. 164; Swinhoe P. Z. S. 1885, p. 144; Watson, Journ. Bombay Nat. Hist. Soc. vol. v. p. 36, no. 107 (1890); Guy Marshall, P. Z. S. 1897, p. 26; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 45 (1897); De. Nicéville, Journ. A. S. Bengal, lxviii. p. 214 (1899).

Teracolus pseudevanthe, Butler, P. Z. S. 1876, p. 164, pl. vii. fig. 16; Swinhoe, P. Z. S. 1885, p. 144.

Teracolus pallens, Moore, Ann. and Mag. Nat. Hist. (4) xx. p. 49 (1877).

Callosune eucharis, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 802 (1877); Hampson, J. A. S., Bengal, lvii. pt. 2, p. 362 (1888-90); Watson, Journ. Bombay Nat. Hist. Soc., vol. viii., pp. 522-523 (1893).

Teracolus tilea, Swinhoe, P. Z. S. 1885, p. 144.

This Indian species is nearly allied to the African *T. auro*, but is at once distinguished by the white ground-colour of the wings, in place of the sulphur-yellow which is the prevailing colour in *T. auro* and its allies.

MALE. "WET-SEASON" FORM.—Central area of the primaries white, the orange apical patch somewhat narrow and enclosed on its inner margin by a pale yellow line, suffused with black, which broadens considerably towards the posterior angle; the apex broadly edged with black, becoming gradually more narrow towards the centre of the hind-margin; base of wing thickly dusted with grey. *Secondaries*. Entirely white, the nervules terminating in brownish black spots on the hind-margin.

Underside.—Primaries white, the apical area yellowish, crossed by a distinct greenish-brown or olive band, the nervules on the apical margin terminating in brownish spots; a slight greenish-brown band traversing the discal area, this band being broadest on the costal margin; and with the usual dusky spot visible at the end of the cell.

Expanse 1.6 inches. (*Spec. ex Coonoor, Nilgiris; W. R. Davison; J. Davidson; Goldman.—Salvin Coll.; Mus. Brit.*).

FEMALE.—Primaries whitish, the apical area brownish-black, extending to about the middle of the costal margin; the posterior angle slightly edged with brownish-black; the dark apical patch crossed by four hastate marks of orange, forming a band; the inner edge of the apical patch irregularly out-lined with pale yellow; base of wing grey with a distinct brownish spot at the end of the cell, and a second and somewhat larger spot visible about the middle of the inner-margin above the submedian nervule. *Secondaries*. Ground-colour whitish, the brownish nervular spots somewhat large on the hind-margin, and with a brownish mark also visible on the costal margin.

Underside.—Primaries whitish; base of wing greenish; apical area yellowish, covered with brownish vermiculations and with minute inter-nervular dots of black on the hind-margin; a post-median band of brown extending from the costal margin to as far as the second median nervule, and strongly marked; a large and distinct spot situated about the centre of the inner margin. *Secondaries*. Ground-colour creamy white, thickly covered with yellowish-brown vermiculations, the broad discal band of greenish-brown strongly indicated and disconnected towards the middle of the wing; the hind-marginal border yellowish, with olive spots at the end of the nervules, with minute inter-nervular black dots also visible on the extreme edge of the marginal border.

Expanse 1.6 inches. (*Spec. ex Bijapur*, July 25, 1892 (*J. Davidson*; coll. *E. M. Sharpe*).

“INTERMEDIATE” FORM OF MALE.—Similar to that of the “wet-season” form in general aspect, but without the inner line of black enclosing the orange apical patch, this patch being relieved by a post-median line of brownish spots; the apex and hind margin brownish-black. *Secondaries* white, with minute black spots visible at the end of the nervules on the hind-margin.

Underside.—Central area white, with the apical area yellow and relieved by a post-median line of dusky spots; the base of the wing greenish-yellow. *Secondaries*. Ground colour sandy-yellow, with faint vermiculations of reddish-brown, the discal line well pronounced on the costal margin.

Expanse 1.5 inches. (*Spec. ex Bombay*, January, 1887; *Mus. Rothschild*).

“INTERMEDIATE” FORM OF FEMALE.—Primaries somewhat more yellow than in the “wet-season” form, the orange band on the apical are slightly broader; the post-median yellow line tinged with orange; the usual dark spot near the inner margin nearly obsolete. *Secondaries* whitish, with brownish nervular spots on the hind-margin; the dark costal mark almost invisible.

Underside.—Primaries with the central area whitish, the base and inner edge of the apical area sulphur-yellow; the apex ochre-yellow with slight brownish vermiculations; a post-median band of brownish spots with silvery centres, strongly indicated as far as the second median nervule; the inner marginal spot of brown, more pronounced than on the upper-surface. *Secondaries*. General colour pinkish-white, thickly covered with brownish-yellow vermiculations, the discal band and hind-marginal border rather more ochre-yellow.

Expanse 1.5 inches. (*Spec. ex Bombay*, June 1887; *Mus. Rothschild*.)

A second form of the “intermediate” male is somewhat similar to the male figured by me (*1d.*) but has the dusky post-median band on the orange apical area almost obsolete. The underside of both wings is whitish, and the olive green post-

median band or the primaries is well pronounced. The discal band on the secondaries is only indicated by an olive-green spot on the costal margin, and towards the hind-margin faint sprinklings of olive-green are visible.

Expanse 1.5 inches. (*Spec. ex Bijapur; August 1892; J. Davidson; coll. E. M. Sharpe*).

“DRY-SEASON” FORM OF MALE.—Central area of the primaries white, the apical area bright orange; the apex and hind-margin narrowly edged with black as far as the first median nervule; a pale yellow line on the inner edge of the orange patch clearly indicated. *Secondaries*. Entirely white without any spots or markings.

Underside.—Central area of the primaries white, greenish-yellow at the base; apical area yellow, with a post median row of reddish spots; hind-margin with minute black inter-nervular dots. *Secondaries*. Entirely sandy-yellow; a faint buff mark visible on the costal margin.

Expanse 1.3 inches. (*Spec. ex North India; Mus. Rothschild*).

“DRY-SEASON” FORM OF FEMALE.—Similar to that of the “intermediate” female (fig. 1*f*.) in spots and markings, the ground-colour of both primaries and secondaries somewhat whiter.

Underside.—Similar to that of the female figured by me (fig. 1*g*.); the secondaries with the ground colour rather more pink.

Expanse 1.3 inches. (*Spec. ex Bombay, March 1887; Mus. Rothschild*).

A second form of the “dry-season” female has the orange apical patch on the primaries almost obsolete, but otherwise it agrees with the female described above (fig. 1*k*.).

Underside.—Primaries white, the base of the wing greenish-yellow, the apical area with brownish vermiculations; the usual post-median band of spots strongly pronounced; the dusky spot near the posterior angle also very distinct. *Secondaries*. General colour pink, thickly covered with brownish vermiculations; the discal band and nervular spots on the hind-margin olive-green.

Expanse 1.2 inches. (*Spec. ex Bombay, February 1887; Mus. Rothschild*).

HABITAT.—Ceylon, throughout Southern India, northwards to Bombay and Khandesh. Ceylon (*Templeton; Butler, P. Z. S. 1876, p. 164*).

NILGHIRI HILLS.—COONHOOR (*W. R. Davison; Godman-Salvin Coll.; Mus. Brit.*). Metapollum, October; *Watson Coll.; Mus. Brit.*

MYSORE.—Kolar, October; Kippenhally, Kadur, Nittur, Arsikari, Banavar, November (*Watson, Coll.; Mus. Brit.; E. Y. Watson, Journ. Bombay, Nat. Hist. Soc., Vol. V., p. 36, No. 107, 1890*).

Belgaum, September (*Swinhoe, P. Z. S. 1885, p. 144*). Bombay; February, July,

November and December (*Col. C. Swinhoe*; *Mus. Brit.*; Cf. *P. Z. S.* 1885, p. 144). Khandesh (*J. Davidson*, *in litt.*).

This species is mentioned by Mr. F. Moore in his "Lepidoptera of Ceylon," but he gives no exact details of the localities where it is to be met with in that island. In the British Museum there are some specimens from Ceylon, one of which is said to be from the neighbourhood of Colombo.

Mr. De Nicéville in his paper on the "Butterflies of Ceylon" (*Journ. A. S. Bengal*, vol. lxviii. pt. 2, p. 214, 1899) writes: "Mr. Pole says that it is not found south of Puttalam, nor along the coast as far as Trincomali, as far as he is aware. It flies in June and December, has apparently two broods, is a very local species, and is a lover of the sun, even on wind-blown and arid sea-shores. It occurs also in South India. Its transformations are unknown."

From the Nilghiri Hills *T. eucharis* is recorded both by Sir George Hampson and the late Capt. E. Y. Watson. They both agree that *T. eucharis* is the "dry-season" form, *T. pseudervanthé* the "wet-season" form; and Capt. Watson considers *T. titea* to be "intermediate." Sir George Hampson writes: "The genera *Callosune* and *Idmuais* frequent the plains at the base of the Nilghiris, and only appear on the plateau as stragglers."

Captain Watson also records *T. eucharis* from Mysore. (Cf. *Journ. Bombay Nat. Hist. Soc.* vol. v. p. 36, No. 107, 1890.)

Colonel Swinhoe obtained it at Belgaum in September and in Bombay in the months of February and December, where it was "very plentiful." (Cf. *P. Z. S.* 1885, p. 144.)

Mr. J. Davidson has kindly given me the following notes: "I have reared *T. eucharis* in Bijapur only. The larva is narrow, and much resembles that of a moth. It is of a dull green, with no line along the back, but with either a yellow or pinkish-white line along each side. It has an extraordinary habit of resting with the anal segment turned up and not resting on a twig. The pupa was very much bent back, far more so than *Terias*, and the head was prolonged into a long thin beak recurved. When first formed it is pale green, but becomes a greyish-white, marbled more or less with brown. The larva feeds on *Candaha indica*."

Dr. Butler writes: "The seasonal forms of this species follow the usual rules; the wet-season forms being heavily marked above, yellowish and white with the usual markings below; the intermediate forms are similar above, but the females show more orange in the apical black patch; the dry-season forms are more lightly marked above, and much more rosy and more strongly striated below. Of each form there are two phases, one showing a double bar on the under surface of the male secondaries, the other only showing a costal dash or dot. Of the double-barred type are, first,

the wet-season form, which has received no distinctive name; then the intermediate form, representing *T. pseudervanthe*; lastly, the dry-season form, which is typical of *T. eucharis*. Of the costal marked type the wet-season form is again unnamed; the intermediate form is *T. aurora*; and the dry-season form *T. pallens*, which differs from all the other phases in showing no trace of the dusky spot on the inner edge of the orange apical patch in the male."

EXPLANATION OF THE FIGURES OF *T. eucharis*.

- Plate 31, fig. 1. ♂ Coonor, Nilghiris (*W. R. Davison*; *Godman-Salvin Coll.*; *Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Bijapur (*J. Davidson*; *E. M. Sharpe Coll.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Bombay, January 1887 (*Mus. Rothschild*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀ Bombay, June 1887 (*Mus. Rothschild*).
 „ 1g. Underside of fig. 1f.
 „ 1h. ♂ Bijapur (*J. Davidson*; *E. M. Sharpe Coll.*).
 „ 1i. ♂ North India (*Mus. Rothschild*).
 „ 1j. Underside of fig. 1i.
 „ 1k. ♀ Bombay, March 1887 (*Mus. Rothschild*).
 „ 1l. Underside of fig. 1k.
 „ 1m. ♀ Bombay, February 1887 (*Mus. Rothschild*).

TERACOLUS EVANTHE (Boisduval).

(Plate 32, figs. 1, 1a-1g.)

- Anthocharis evanthe*, Boisduval, Spec. Gén. Léop. i. p. 567 (1836); Mabille, in Grandid. Hist. Nat. Madag. p. 293, pl. 41, figs. 1, 1a, 2 (1887).
Teracolus evanthe, Butler, P. Z. S. 1876, p. 165; Guy Marshall, P. Z. S. 1897, p. 26; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 45 (1897); Aurivillius, Rhop. Æthiopica, p. 438 (1898).
Anthocharis ena, Mabille, Bull. Soc. Philom. (7) iii. p. 134 (1879); *id.* in Grandid. Hist. Nat. Madag. pl. 40, figs. 6, 6a (1887).

Allied to *T. eucharis* in coloration and markings, but with the dark nervular spots on the secondaries nearly obsolete, and with the underside thickly speckled with a dusting as of pepper. The female has a distinct orange band on the apical area, followed by a sulphur-yellow band very plainly marked on the inner edge of the latter; the nervular spots on the secondaries more or less strongly indicated. Underside thickly speckled.

MALE.—Central area of the primaries creamy-white, the apical area bright orange; the costa, apex, and hind-margin narrowly edged with black; a distinct and some-

what broad transverse line of black enclosing the orange apical patch, and slightly broken by orange near the costa, the disco-cellular spot nearly obsolete; the basal area thickly dusted with grey. Secondaries entirely creamy-white; the black nervular spots on the hind-margin nearly obsolete; the basal area dusted with grey.

Underside.—Central area of the primaries white, the apical area tinged with a pink shading corresponding to the orange patch on the upperside; the base, costa, and apical area thickly dusted with grey; a minute black spot visible at the end of the cell. Secondaries deep creamy-white, and entirely covered with pepper-coloured specklings.

Expanse 1.5 inches. (*Spec. ex Betsileo, Madagascar; Rev. Deans Cowan; Mus. Brit.*).

FEMALE.—Central area whitish; apex and hind-margin brownish-black as far as the first median nervule; a very distinct post-median band of bright orange consisting of five somewhat pointed spots towards the hind-margin; the inner side of the orange irregularly outlined with brownish-black, followed by a sulphur-yellow suffusion, the usual black spot visible at the end of the cell; the basal area dusted with grey. Secondaries, ground colour whitish, with dusky spots at the end of the nervules on the hind-margin, more or less obsolete; the base of the wing slightly dusted with grey, the discal band on the underside faintly indicated; the cilia of both wings reddish-buff.

Underside.—Central area of the primaries white, the apical area yellowish-buff, thickly sprinkled with grey, extending along the costal margin to the basal area; a sulphur-yellow suffusion on the costa and on the inner edge of the apical area; minute black nervular spots visible on the hind-margin. Secondaries, ground-colour pale buff, thickly sprinkled with greyish-brown, a discal band of greyish-brown visible from the costal margin to the second radial nervule, but absent from the third median nervule to as far as the sub-median nervule; minute black nervular spots visible on the hind-margin; a reddish spot at the end of the cell.

Expanse 1.4 inches. (*Spec. ex Port Dauphin, South Madagascar; G. F. Scott-Elliot; Mus. Brit.*)

A second form of the female has the orange band on the primaries less pronounced on account of a brownish suffusion; the sulphur-yellow line only faintly indicated; the nervular spots on the secondaries slightly larger.

Underside.—The general aspect of both wings paler in colour, but otherwise similar to the female above described (fig. 1e).

Expanse 1.6 inches. (*Spec. ex Madagascar; Godman-Salvin Coll.; Mus. Brit.*)

A third form of the female has the whole of the apical area of the primaries brownish-black, relieved by three minute streaks of orange, the sulphur-yellow shading being almost obsolete. Secondaries with the nervular spots on the hind-margin small.

Underside.—The colour and markings of both the primaries and secondaries agree with that of the second form of the female above described.

Expanse 1.4 inches. (*Spec. ex Port Dauphin, South Madagascar; G. F. Scott-Elliot.*)

A fourth form has no indication of the orange on the brownish-black apical area of the primaries; the basal area more thickly sprinkled with grey. Secondaries not different in colour and markings.

Underside.—Central area of the primaries white; base and apical area with greenish striations. Secondaries, ground-colour white, covered with greenish striations; and with minute black nervular dots visible on the hind-margin.

Expanse 1.6 inches. (*Spec. ex Madagascar; Godman-Salvin Coll.; Mus. Brit.*)

HABITAT.—Madagascar.

Madagascar (*Bates Coll.; Godman-Salvin Coll.; Mus. Brit.*). Antananarivo; *Mus. Brit.*). Betsileo: Ankafana Forest (*Rev. Deans Cowan; Mus. Brit.*). Port Dauphin, South Madagascar (*G. F. Scott-Elliot; Mus. Brit.*).

Of this species Mr. Guy Marshall writes: "A curious species, linking *T. evarne* and *T. evippe* groups; peculiar to Madagascar. *T. ena* does not seem to present any characters entitling it to specific rank."

Dr. Butler also makes the following remarks: "This species appears to have no wet-season form. The variety *T. ena* is perhaps a little drier in character than the type, but both belong to the dry-season phases."

Beyond the fact that Mr. Mabille says that it is very common over all the island, and that the females are rarer than the males there seem to be no further notes published on the species.

EXPLANATION OF THE FIGURES OF *T. evanthe*.

- Plate 32, fig. 1. ♂ Betsileo, Madagascar (*Rev. Deans Cowan; Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Port Dauphin, South Madagascar (*G. F. Scott-Elliot; Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀ Madagascar (*Godman-Salvin Coll.; Mus. Brit.*).
 „ 1e. ♀ Port Dauphin, South Madagascar (*G. F. Scott-Elliot; Mus. Brit.*).
 „ 1f. ♀ Madagascar (*Godman-Salvin Coll.; Mus. Brit.*).
 „ 1g. Underside of fig. 1f.

TERACOLUS ETRIDA (Boisduval).

(Plate 33, figs. 1, 1a-1m.)

Anthocharis etrida, Boisd. Spec. Gén. Lép. i. p. 576 (1836).

Teracolus etrida, Butler, P. Z. S. 1870, p. 726, 1876, p. 160, 1881, p. 609; Swinhoe, P. Z. S.

- 1884, p. 510; 1885, p. 144; Aitken, Journ. Bombay Nat. Hist. Soc. ii. p. 38 (1887); Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. v. p. 359 (1890); Watson, Journ. Bombay Nat. Hist. Soc. v. p. 36 (1890); *id. op. cit.* viii. pp. 522, 523 (1893); Guy Marshall, P. Z. S. 1897, p. 26; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 456 (1897); Mackinnon and De Nicéville, Journ. Bombay Nat. Hist. Soc. xi. p. 591 (1898).
- Teracolus pernotatus*, Butler, P. Z. S. 1876, p. 159, pl. vii. fig. 1; Swinhoe, P. Z. S. 1884, p. 511, 1885, p. 144, 1886, p. 432.
- Teracolus farrinus*, Butler, P. Z. S. 1876, p. 159, pl. vii. fig. 2; *id.* P. Z. S. 1886, p. 373.
- Teracolus purus*, Butler, P. Z. S. 1876, p. 160, pl. vii. figs. 14, 15, 1881, p. 610, 1886, p. 374.
- Teracolus casimirus*, Butler, P. Z. S. 1876, p. 161, pl. vii. fig. 5.
- Teracolus bimbura*, Butler, P. Z. S. 1876, p. 161, pl. vii. figs. 3, 4, 1881, p. 610; Swinhoe, P. Z. S. 1884, p. 511, 1885, p. 144, 1886, p. 433.
- Callosune etrida*, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 803 (1877); Hampson, Journ. As. Soc. Bengal, 1888, p. 362.
- Callosune bimbura*, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 803 (1877).
- Callosune casimirus*, *id. t.c.* p. 803 (1877).
- Callosune farrinus*, *id. t.c.* p. 804 (1877).
- Callosune pernotatus*, *id. t.c.* p. 805 (1877).
- Callosune purus*, *id. t.c.* p. 805 (1877).
- Callosune farrina*, Moore, P. Z. S. 1882, p. 254.
- Callosune pura*, Moore, P. Z. S. 1882, p. 254.

Teracolus etrida is at once distinguished from *T. eucharis* by the much more reddish tint of the orange on the apical area, which is also more restricted and is enclosed by a broad transverse brownish-black line. The female also has a more reddish orange apical band, with two distinct brownish spots visible on the primaries, one spot being situated between the first and second median nervules and a second spot appearing above the sub-median nervure. This character seems to be specific and appears throughout all the seasonal phases.

MALE.—Central area of the primaries white, with a pale suffusion of lemon-yellow towards the apical area; the orange-red apical patch lined on the inner side with a very distinct, broad band of black; costa, apex, and hind-margin with a broad border of black, which becomes extremely narrow on the posterior angle; the base of the wing blackish, thickly sprinkled with grey, extending along the discoidal cell; the usual minute black dot visible at the end of the cell. Secondaries entirely creamy-white; the nervules terminating in large brownish-black spots on the hind-margin, but distinctly separated by white streaks, with a dusky spot visible near the end of the costal margin.

Underside.—Primaries with the central area white; the apical area yellow; the apex, costa, and basal area greenish-yellow; an olive-green band on the inner edge of the yellow apical patch; the black discoidal spot at the end of the cell plainly

indicated. Secondaries, ground colour whitish, the hind-margin greenish-yellow; an olive-green transverse band crossing the discal area, becoming almost obsolete towards the inner margin; the basal area faintly sprinkled with grey, the black disco-cellular spot lined on its inner edge with orange-yellow.

Expanse 1.6 inches. (*Spec. ex Bombay; John Thorpe; Mus. Brit.*)

FEMALE.—Central area of the primaries creamy-white, the orange-red apical patch slightly narrower than in the male, but similarly margined on the inner edge by a broad line of brownish-black, followed by a narrow line of sulphur yellow; the costal margin narrowly edged with black; the apex and hind-margin as far as the first median nervule showing a black border; a small dusky spot between the first and second median nervules, and a dusky twin spot near the posterior angle situated above the sub-median nervure; the basal area dusky, sprinkled with grey; the usual black dot visible at the end of the cell. Secondaries, ground colour creamy-white, with a light suffusion of sulphur-yellow, the nervules terminating in brownish-black spots on the hind-margin, each spot separated by a streak of yellowish-white; a somewhat large twin spot of brownish black on the costal margin; the basal area dusky sprinkled with grey.

Underside.—Central half of the wing whitish; the basal area greenish-yellow, extending along the costal margin. The apical area greenish-yellow, and traversed by a distinct band of olive-green, the characteristic dusky spots on the upperside well pronounced; these spots, although disconnected, forming a transverse discal band. Secondaries, ground colour creamy-white, with a shading of greenish-yellow on the hind-margin; a band of olive-green crossing the discal area, somewhat disconnected near the centre of the wing; a greyish dusting visible everywhere, but more thickly distributed on the basal area; the minute black dot at the end of the cell edged with orange-yellow on its basal side.

Expanse 1.5 inches. (*Spec. ex Fao, Persian Gulf, September 7, 1889; W. D. Cumming; Mus. Brit.*)

“INTERMEDIATE” FORM OF MALE.—Primaries white, the orange-red patch smaller; the brownish-black hind-margin terminating above the first median nervule; the disco-cellular spot very minute; basal area faintly sprinkled with grey. Secondaries, ground colour white, the brownish-black nervular spots much reduced in size.

Underside.—Central area white, the base greenish-yellow; apical area greenish-yellow, with an olive-green transverse band. Secondaries entirely white; the nervules terminating in greenish spots on the hind-margin; a minute orange spot in the cell; a twin spot of greenish-yellow at the end of the costal margin.

Expanse 1.2 inches. (*Spec. ex Wazirabad, Punjab; Brigadier Hearsey; Mus. Brit.; Type of T. purus.*)

“INTERMEDIATE” FORM OF FEMALE.—The size is rather smaller, and the ground colour somewhat white; otherwise the spots and markings do not differ from those of the “wet-season” form.

Underside.—Similar to that of the “wet-season” form of the male above described.

Expanse 1.2 inches. (*Spec. ex Wazirabad, Punjab; Brigadier Hearsey; Mus. Brit.; Type of T. purus.*)

“DRY-SEASON” FORM OF MALE.—Smaller in size, and entirely white on the central area of the primaries; the brownish-black borders enclosing the orange apex much narrower; the basal area faintly sprinkled with grey. Secondaries white; the brownish nervular spots on the hind-margin somewhat smaller.

Underside.—Central area of the primaries white, the apical area yellowish-buff, dusted with greyish sprinklings, the olive-greenish transverse band visible; basal area greenish-yellow. Secondaries, the whole of the ground-colour yellowish-buff, somewhat lighter on the hind-margin; the dusky transverse band well indicated; the basal area thickly dusted with grey.

Expanse 1.2 inches. (*Spec. ex Mean Meer, October 31, 1890; Harford Coll.; Mus. Brit.*)

“DRY-SEASON” FORM OF FEMALE.—Much smaller in size, the central area creamy-white; the orange apical patch narrower; the brownish-black transverse line slightly broken towards the hind-margin; the dusky spots very minute, the spot above the sub-median nervure being almost obsolete. Secondaries creamy-white, the dusky nervular spots on the hind-margin small.

Underside.—Central area whitish, the basal area greenish-yellow; apical area yellowish-buff; the transverse olive-green band plainly indicated. Secondaries, ground-colour sandy-yellow, with greyish dustings; the brownish discal band only faintly marked.

Expanse 1.1 inches. (*Spec. ex Mean Meer, October 19, 1890; Harford Coll.; Mus. Brit.*)

A second form of the “dry-season” female has the orange on the apical area of the primaries nearly obsolete, the brownish transverse line well-pronounced, and the basal area thickly sprinkled with grey. Secondaries having the brownish nervular spots somewhat larger on the hind-margin, the brownish spot on the costal margin also larger, and a faint dusky line faintly traversing the discal area.

Underside.—With the exception that all the dusky spots on both wings are larger, and that the apical area on the primaries, as well as the entire ground colour of the secondaries, is sandy-buff, though thickly suffused with greyish dustings, the colouring agrees with that of the female above described.

Expanse 1.1 inches. (*Spec. ex Mean Meer, October 7, 1890; Harford Coll.; Mus. Brit.*).

HABITAT.—From Southern and Central India to North-western India and Sind; eastwards to the Persian Gulf.

Nilghiri Hills (*Godman-Salvin Coll.; Mus. Brit.*; Hampson, Journ. A. S. Bengal, 1888, p. 362).

MYSORE.—Kolar, October (Watson, Journ. Bombay Nat. Hist. Soc. vol. v. p. 36, 1890). Berhampur, Ganjam, August 1897 (*Watson Coll.; Mus. Brit.*). Hoshungabad, Singanama, Kesla, C. India (*Bethan, teste De Nicéville, in epist.*). Orissa (*Taylor; De Nicéville, in epist.*). Bombay, September (Swinhoe, P. Z. S. 1885, p. 144). Poona, January, February, June, October and November (Swinhoe, P. Z. S. 1885, p. 144). Canara, very rare (Davidson, Bell, and Aitken, Journ. Bombay Nat. Hist. Soc. x., p. 572, 1897). Khandesh, Nassic, and Guzerat (*J. Davidson, in epist.*). Ahmednuggar, November (Swinhoe, P. Z. S. 1885, p. 144). Mhow, January and September (Swinhoe, P. Z. S. 1886, p. 432). Neemuch, September (Swinhoe, *t.c.* p. 432). Agra (*De Nicéville, in epist.*). Mean Meer, October (*Harford Coll.; Mus. Brit.*). Wazirabad, Punjab (*Brigadier Hearsey; Mus. Brit.*). Campbellpur, June, July, October and November (*Col. Yerbury; Butler, P. Z. S. 1886, p. 374*). Hassan, Abdal (*Col. Yerbury; Butler, l.c.*). Masuri, "very rare" (Mackinnon and De Nicéville, Journ. Bombay Nat. Hist. Soc. xi. p. 591, 1898). Simla (*De Nicéville, in epist.*). Kussowlie (Butler, P. Z. S. 1876, p. 159). Attock Bridge, Khairabad side, November, Chittar Pahar, Lumbahdun (2000 feet), November (*Col. Yerbury; Mus. Brit.*). Between Tret and Barracoo, Murri and Rawul Pindi road, October (*Col. Yerbury; Butler, P. Z. S. 1886, p. 373*). Bimbur, Cashmere (Butler, P. Z. S. 1876, p. 161). Sind, Jhelum River (*Rev. A. B. Spaight; Butler, P. Z. S. 1870, p. 726*). Multan (*De Nicéville, in epist.*). Karachi, April to February (Swinhoe, P. Z. S. 1884, p. 511; Butler, P. Z. S. 1881, p. 610).

PERSIAN GULF.—Fao (*W. D. Cumming; Mus. Brit.*).

As Mr. Guy Marshall has already pointed out, this species is the Indian representative of the African *T. evippe*. Dr. Butler has separated several phases of this species under distinct specific names—viz., *T. pernotatus*, *T. farrinus*, *T. purus*, *T. casimirus*, and *T. bimbur*. Watson remarks (cf. Journ. Bombay Nat. Hist. Soc. vol. viii. pp. 522, 523, 1893): "The first four named forms of the second series, *T. etrida*, *T. farrinus*, *T. pernotatus* and *T. purus* are practically inseparable; *T. bimbur*, which is in the British Museum, only from North-west India, differs in having a reddish-brown underside, but this is a character which is found in specimens from Southern India, and is merely varietal, probably more or less seasonal."

On this question the latest opinion of Dr. Butler is as follows: "Of the varieties of *T. etrida* to which I gave distinctive names, *T. farrinus* is the most heavily marked on the upper surface, though *T. pernotatus* runs it very close; *T. purus* is a dwarf form of the species with rather more orange at the apex than in the typical *T. etrida*. These are all wet-season or intermediate forms. The dry-season phase is represented by *T. casimirus* and the starved form of it which I described under the name of *T. bimbura*."

Mr. De Nicéville, who has kindly informed me of several unpublished localities for this species, writes: "I have caught *T. etrida* at Simla at 6000 feet, and at Agra. It has a quick flight for so frail an insect, and keeps near the ground, dodging about between the herbage and bushes, so is not easy to catch, as one's net gets 'hung up.'"

Messrs. J. Davidson and E. H. Aitken (Journ. Bombay Nat. Hist. Soc. 1890, vol. v. p. 359) writes: "We have reared this in Bombay in the month of December on *Cadaba indica*. From the very meagre note we made at the time, the larva appears to have been like that of *Terias hecabe*, but perceptibly enlarged near the posterior extremity. The pupa was also like that of *Terias*, but stouter, and the snout was long and sharply recurved. The colour was pale straw or dirty white."

Mr. Aitken (Journ. Bombay Nat. Hist. Soc. 1887 ii. p. 38) writes as follows: "I have not yet seen any reason to believe that all the orange-tipped *Teracoli* in this Presidency constitute more than one species. It is subject, like most of the *Pierinae*, to very wide variation, which does not seem to depend much on climate or season. I have reared very different varieties from larvæ taken at one time, in the same spot, if not on the same plant. The larva feeds on a small climbing caper which is very common on the hilly parts of Bombay. (Young plant of *C. horrida*?) It is nearly cylindrical, slender, and of a uniform green colour, with the rough surface characteristics of the larvæ of *Catopsilia* and *Terias*. The pupa has a sharp transverse ridge above, at the junction of the thorax and abdomen, which extends well beyond the general outline on each side, forming a pointed lateral process. From this a dorsal ridge runs out into a similar point just over and behind the head. The colour is light green, with a triangular patch of yellowish-white on the anterior side of each lateral process and a similar patch covering the top of the head. This species is in season at the commencement of the hot weather."

Colonel Yerbury has kindly given me the following notes:—"Very common: may be met with anywhere in the neighbourhood of Campbellpur, but shows a slight preference for the bushes of *Capparis aphylla*, the 'blazing bush' of the Punjab and Rajputana."

Mr. J. Davidson writes to me: "All my specimens are from Khandesh, Nassic,

and Guzerat, but I fully believe I have seen it in the other districts I have served in."

I do not agree with Mr. Guy Marshall in adding *T. limbatus* to this species, and I have therefore followed Dr. Butler in keeping it distinct, as a Ceylonese form.

EXPLANATION OF THE FIGURES OF *T. etrida*.

- Plate 33, fig. 1. ♂ Bombay (*John Thorpe; Mus. Brit.*),
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Fao, Persian Gulf, September 7, 1889 (*W. D. Cumming; Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Wazirabad, Punjab (*Brigadier Hearsey; Mus. Brit.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀ Wazirabad, Punjab (*Brigadier Hearsey; Mus. Brit.*).
 „ 1g. Underside of fig. 1f.
 „ 1h. ♂ Mean Meer, October 31, 1890 (*Harford Coll.; Mus. Brit.*).
 „ 1i. Underside of fig. 1h.
 „ 1j. ♀ Mean Meer, October 19, 1890 (*Harford Coll.; Mus. Brit.*).
 „ 1k. Underside of fig. 1j.
 „ 1l. ♀ Mean Meer, October 17, 1890 (*Harford Coll.; Mus. Brit.*).
 „ 1m. Underside of fig. 1l.

TERACOLUS LIMBATUS, Butler.

(Plate 34, figs. 1, 1a-1g.)

Teracolus limbatus, Butler, P. Z. S. 1876, p. 161; Swinhoe, P. Z. S. 1884, p. 511; Watson, Journ.

Bombay Nat. Hist. Soc. viii. pp. 522, 523 (1893); Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 456 (1897).

Callosune limbatus, Kirby, Syn. Diurn. Lepid. Suppl. p. 804 (1877).

Callosune limbata, Moore, Lepid. Ceylon, i. p. 129 (1881).

Teracolus etrida (part.), Guy Marshall, P. Z. S. 1895, p. 26.

Distinguished from the Indian species *T. etrida*, by the much broader transverse band of brownish-black on the primaries, the hind-marginal border extending to the posterior angle; the sulphur-yellow shading being absent.

MALE.—Central area of the primaries white, dusted with grey at the base; the orange-red patch slightly smaller and enclosed by a broad border of brownish-black; the costa and hind-margin also brownish-black, terminating on the posterior angle; no shade of sulphur-yellow. Secondaries, central area white; the brownish-black hind-marginal border similar to that of *T. etrida*.

Underside.—Primaries and secondaries similar to those of *T. etrida* as regards colour and markings; the discal band on the secondaries nearly obsolete.

Expanse 1·3 inches. (*Spec. ex Puttalam, Ceylon; J. Pole; Mus. Brit.*)

FEMALE.—Very similar to that of *T. etrida*, but with the sulphur-yellow shading on the primaries rather more pronounced; the dusky spot above the sub-median nervure on the primaries nearly obsolete. Secondaries similar to those of *T. etrida*, but having the brownish-black marginal border somewhat broader than in that species.

Underside.—Central area of the primaries white; the basal area, costal margin, apical area, and hind-margin greenish-yellow; the spots and markings similar to *T. etrida*. Secondaries, ground colour whitish, thickly sprinkled with greenish-grey.

Expanse 1·4 inches. (*Spec. ex Puttalam, Ceylon; J. Pole; Mus. Brit.*)

“DRY-SEASON” FORM OF MALE.—Central area of the primaries creamy-white, the apical patch slightly more reddish in colour; the brownish-black transverse line somewhat broader and terminating on the posterior angle; base and costal margin dusted with grey. Secondaries creamy-white; the brownish-black nervular spots larger and forming a distinct border.

Underside.—Central area creamy-white, the base and apical area of the primaries greenish-yellow; a minute black dot at the end of the cell. Secondaries creamy-white, with a greenish-yellow border on the hind-margin, and with a minute black dot visible at the end of the cell.

Expanse 1·2 inches. (*Spec. ex Trincomali, Ceylon, July 17, 1890; Colonel Yerbury; Mus. Brit.*)

“DRY-SEASON” FORM OF FEMALE.—Central area of the primaries white, with greyish dusting at the base, the orange-red patch larger than in *T. etrida*; the brownish-black transverse line somewhat broader, edged on the inner side with a sulphur-yellow line; the two dusky spots situated above the sub-median nervure and between the first and second median nervules, nearly obsolete; the costa and hind-margin brownish-black, terminating at the posterior angle. Secondaries creamy-white, the nervules terminating in large brownish-black spots on the hind-margin.

Underside.—Central half of the primaries white, the basal area, costal margin, and apical area being greenish-yellow; the olive-green discal band strongly pronounced. Secondaries, ground colour whitish, sprinkled with a greyish dusting, the olive-greenish discal band somewhat faintly marked, a border of greenish-yellow on the hind-margin; the discoidal spot well pronounced.

Expanse 1·2 inches. (*Spec. ex Ceylon; J. Pole; Mus. Brit.*)

HABITAT.—Ceylon.

Ceylon (*R. Templeton; Mus. Brit.; Type of Species*). Ceylon (*A. Whyte; Godman-Salvin Coll.; Mus. Brit.*). Puttalam (*J. Pole; Mus. Brit.*). Trincomali, March and July (*Col. Yerbury; Mus. Brit.*). Hambantotte (*Wade; Moore, Lepid. Ceylon, i. p. 129, 1881*). Vavoniya Vilankulam (*Pole; Moore, l.c. p. 129, 1881*).

This species is a heavily marked form of *T. etrida*, restricted to Ceylon. Most specimens examined by me have been clearly distinguishable, but there are many which it is impossible to separate from *T. etrida*, and thus it can never be considered more than an insular race of the latter species. In this view I am supported by the opinion of Mr. De Nicéville, Mr. Guy Marshall, and other naturalists. Colonel Swinhoe's conclusion that the species occurs near Karachi is doubtless based upon some strongly marked examples of *T. etrida*.

Dr. Butler, who considers that *T. limbatus* is a distinct species, writes: "The males of this species are always heavily bordered, and sometimes so much so that the marginal spots are perfectly confluent throughout; the species seems never to attain to the size of the largest examples of *T. etrida*. The female on the upper surface (like its male) resembles most nearly that sex of *T. etrida*, var. *farrinus*, but is more heavily bordered, shows scarcely a trace of the spot on the interno-median area of the primaries, has brown instead of black markings on the under surface of these wings, and the discal markings on the secondaries very ill-defined. An example of this sex is in the Hewitson collection."

EXPLANATION OF THE FIGURES OF *T. limbatus*.

- Plate 34, fig. 1. ♂ Puttalam, Ceylon (*J. Pole; Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Puttalam, Ceylon (*J. Pole; Mus. Brit.*)
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Trincomali, Ceylon, July 17, 1890 (*Col. Verbury; Mus. Brit.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀ Ceylon (*J. Pole; Mus. Brit.*).
 „ 1g. Underside of fig. 1f.

TERACOLUS EVANTHIDES (Holland).

(Plate 34, figs. 2, 2a.)

Callosune evanthides, Holland, Proc. U. S. Nat. Mus. vol. xviii. p. 268, pl. viii. fig. 9 (1895).

Teracolus evanthides, Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 45 (1897); Aurivillius, Rhop.

Æthiopica, p. 438 (1898).

MALE.—Allied to *C. evanthe*, Boisduval. The wings on the upperside are white, powdered at the base with greyish scales. The primaries are broadly tipped with orange-red. This orange-red space is narrowly bordered with black on the anterior margin, and more widely bordered with black on the outer margin. The black border of the outer margin is produced inwardly for a short distance on each of the nervules, and is inflected inwardly just above the extremity of vein 2, being at this

point somewhat widely separated from the outer margin by a white line. A transverse oblique band of black, poorly defined, runs from the extremity of vein 2, toward the end of the cell, and serves to delimit the orange-red apical patch from the white inner area of the wing along the lower half of its inner margin. There is a short, pale orange, transverse bar at the end of the cell. The secondaries have the ends of the nervules lightly tipped with black.

On the underside the primaries are white, with the orange-red of the apical patch faintly showing through from the upperside. There is a minute black spot at the end of the cell. The costa and the apical area are laved with pale yellow, and profusely irrorated with pale-brown spots and strigæ.

The secondaries on the underside are pale yellow, profusely covered throughout with pale brown spots and strigæ like those on the primaries. The body is blackish above and pale yellow below. The antennæ are black (Holland, *l.c.*).

FEMALE.—Like the male, but the black sub-apical transverse line delimiting the orange-red apical patch on its inner side is, in this sex, continued across the wing to the costa, instead of terminating, as in the male, before reaching the end of the cell, and there is a black spot at the end of the cell on both primaries and the secondaries.

Expanse 28–38 mm. (Holland, *l.c.*).

HABITAT.—Aldabra Island, Indian Ocean.

This species is evidently closely allied to *T. ephyia*, from Nubia, and it is interesting to find such a form apparently restricted to an island in the Indian Ocean.

I follow Dr. Butler in keeping it distinct, but I must say that I cannot see any characters which justify the separation of *T. evanthides* from *T. ephyia*. This is probably because I have never seen an actual specimen, the Aldabra species being unrepresented in any museum in this country. Doubtless on comparison with its Nubian ally specific differences would be easily discovered, as it is difficult to believe that an Aldabra butterfly could be specifically identical with a Nubian species. For the opportunity of figuring *T. evanthides* in the present work, I am indebted to Dr. Harrison G. Dyar, of the U. S. National Museum, who most kindly sent me coloured drawings of the types, and I thank him most heartily for this evidence of international courtesy, without which my work would have been rendered imperfect.

Dr. Butler's opinion is as follows: "Allied to *C. evanthe*, but evidently distinct. It has the brown irroration and striation of the under surface characteristic of the dry-season *T. evanthe* of Madagascar, but upon a pale yellow ground tint, whereas in *T. evanthe* the ground-colouring of the under surface is dead white."

EXPLANATION OF THE FIGURES OF *T. evanthides*.

Plate 34, fig. 2. ♂ Aldabra Island.

„ 2a. ♀ Aldabra Island.

TERACOLUS EPHYIA (Klug).

(Plate 35, figs. 1, 1a-1e.)

Pontia ephyia, Klug, Symb. Phys. pl. vi. figs. 9, 10 (1829).*Callosune ephyia*, Kirby, Syn. Cat. Diurn. Lepid. p. 503 (1871).*Teracolus ephyia*, Guy Marshall, P. Z. S. 1897, p. 25; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 457 (1897); Aurivillius, Rhop. Æthiopica, p. 439 (1898).

Teracolus ephyia is distinguished from *T. evanthides* by having the dark transverse line on the primaries more distinct and not broken up as in the latter species. Scarcely any suffusion of yellow is visible.

MALE.—Central area of the primaries creamy-white, faintly dusted with grey at the base; the orange apical patch very bright in colour, narrowly edged along the costa, and on the apex and hind-margin with brownish-black to as far as the first median nervule; the brownish-black transverse band is broader, with a slight suffusion of pale yellow; the usual minute black dot is visible at the end of the discoidal cell. Secondaries entirely creamy-white; the nervules terminating in black hastate spots on the hind-margin.

Underside.—Ground colour of the primaries whitish; the apical area pale yellow; the base greenish-yellow, extending to the discoidal cell; the black dot at the end of the cell strongly marked. Secondaries white, with a greenish-yellow shading on the hind-margin; the usual minute black dot in evidence at the end of the cell.

Expanse 1.3 inches. (*Spec. ex "Upper Egypt"; Consul Petherick; Mus. Brit.*)

FEMALE.—Central area of the primaries creamy-white; the orange apical patch not quite so bright as in the male; the costa, apex, and hind-margin dusty-brown to as far as the first median nervule; the dusky transverse band somewhat irregular in outline; the pale-yellow suffusion somewhat more distinct, and the minute black spot at the end of the cell rather larger than in the male. Secondaries, general colour creamy-white, the dusky-brown nervular spots on the hind-margin also larger.

Underside.—Centre of the primaries white; the base, costal margin, and apical area pale yellow; the usual black spot visible at the end of the cell; no other spots or markings indicated. Secondaries creamy-white; hind-margin and nervules yellowish-green; the usual black dot present at the end of the cell.

Expanse 1.4 inches. (*Spec. loc. ign., Godman-Salvin Coll.; Mus. Brit.*)

"DRY-SEASON" FORM OF MALE.—Central area of the primaries yellowish-white; the orange apical patch somewhat brighter in colour; the black markings much reduced and almost obsolete; the black transverse line likewise indicated by a few faint streaks; the pale yellow line more strongly marked than in the "wet-season" form. Secondaries yellowish-white; the black nervular spots almost invisible.

Underside.—Central area of the primaries whitish, the basal area and apical area pale yellow. Secondaries sandy-yellow, without any spots or markings.

Expanse 1.1 inches. (*Spec. ex "Upper Egypt"; Consul Petherick; Mus. Brit.*)

HABITAT.—“Upper Egypt” (*Consul Petherick; Mus. Brit.*). Ambukol, Nubia (*Klug*).

This species seems to be rare, as there are only three examples in the British Museum, all of which I have figured. I agree with Dr. Butler in keeping this species distinct. The females associated with *T. ephyia* in the British Museum by Dr. Butler were wrongly identified, as Mr. Guy Marshall has pointed out: in this Dr. Butler agrees. Mr. Guy Marshall considered that they were inseparable from the females of *T. microcale*, Butler. Mr. Guy Marshall also identified *T. demagore*, with its reduced black markings above and pinkish underside, as the dry-season form of *T. ephyia*, but Dr. Butler unites it with *T. दौरα*, of which he considers it to be the dry-season form.

He writes: “The wet-season form of the male nearly resembles the male of typical *T. etrida* on the upper surface, but the female shows no trace of the internommedian spot of that species, whilst on the under surface all the discal spots are wanting. The dry-season form is smaller, shows scarcely a trace of the black inner edging to the orange sub-apical patch; the secondaries also have no marginal spots, and the under surface is suffused with buff.”

EXPLANATION OF THE FIGURES OF *T. ephyia*.

- Plate 35, fig. 1. ♂ “Upper Egypt” (*Consul Petherick; Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ *loc. ign.* (*Godman-Salvin Coll.; Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ “Upper Egypt” (*Consul Petherick; Mus. Brit.*).
 „ 1e. Underside of fig. 1d.

TERACOLUS LAIS, Butler.

(Plate 35, figs. 2, 2a–2f.)

Teracolus lais, Butler, P. Z. S. 1876, p. 145; Trimen, S. Afr. Butt. iii. p. 155 (1889); Guy Marshall, P. Z. S. 1897, p. 32; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 457 (1897); Aurivillius, Rhop. Æthiopica, p. 438 (1898).

Teracolus halyattes, Butler, P. Z. S. 1876, p. 145, pl. vi. fig. 8; Trimen, *t.c.* iii. p. 139 (1889); Guy Marshall, P. Z. S. 1897, p. 30.

Teracolus lycoris, Butler, P. Z. S. 1876, p. 140, pl. vi. fig. 6 (♀).

Callosune lais, Kirby, Syn. Cat. Diurn. Lepid. Suppl. p. 804 (1877).

Callosune halyattes, Kirby, *t.c.* p. 804 (1877).

Callosune lycoris, Kirby, *t.c.* p. 805 (1877).

Distinguished from *T. ephygia* by the inner transverse band of black, which, commencing near to the middle of the costal margin, unites with the hind-margin above the first median nervule. The yellow suffusion is entirely absent. The female has a dusky line and spot on the inner margin.

MALE.—Central area of the primaries white; the apical area orange yellow, the costal margin narrowly edged with black; the apex and hind-margin black to as far as the first median nervule; the transverse blackish line, which starts from the centre of the costal margin, joining the hind-margin; the usual minute black spot visible at the end of the cell; the base faintly dusted with grey extending along the inner margin. Secondaries entirely white; the nervules terminating in brownish-black spots on the hind-margin; the base of the wing speckled with grey.

Expanse 1·7 inches. (*Spec. ex Kimberley; Godman-Salvin Coll.; Mus. Brit.*)

Underside.—Primaries white, the apical area pale orange with greyish dustings; the dark transverse band on the upper surface faintly indicated; the black discocellular spot well marked. Secondaries with the ground-colour whitish, thickly covered with greyish specklings; the orange spot at the end of the cell relieved by a minute black dot; the nervules terminating in minute black dots on the hind-margin.

Expanse 1·2 inches. (*Spec. ex South Africa; Mus. Brit.*)

FEMALE.—Central area of the primaries white; the orange apical patch narrower than in the male and consisting of five spots; the costa and inner edge of the orange apical patch narrowly edged with black; the apex and hind-margin to as far as the first median nervule, brown; base inclining to brown, which shade extends along the costal and inner margins; a brownish spot visible near the posterior angle. Secondaries white, the base and costal margin brownish; a distinct brownish patch visible on the apex; the first and second median nervules terminating in brownish spots on the hind-margin.

Underside.—Primaries white, the apical area relieved by a band of orange, the apex and hind-margin yellowish green; a brownish spot visible near the posterior angle. Secondaries white, the basal area of the wing and the hind-margin dusted with brownish-buff; the discal area entirely white; a dusky brown patch on the apex visible, as well as the nervular spots on the hind-margin; on the costal margin an extremely narrow line of orange.

Expanse 0·9 inch. (*Spec. ex S. Africa; Godman-Salvin Coll.; Mus. Brit.*)

“DRY-SEASON” FORM OF MALE.—Central area of the primaries whitish, the apical patch suffused with orange vermillion; costa, apex, and hind-margin edged with black; the transverse band across the wing strongly marked and somewhat more oblique than in *T. ephygia*, the base of the wing dusted with grey, more thickly sprinkled

on the inner margin. Secondaries entirely whitish; the nervules terminating in dusky black hastate spots on the hind-margin, the base dusted with blackish-grey.

Underside.—Central half of the primaries white; the apical area reddish-buff, with greyish-brown striations; a rather faint mark of the same colour visible towards the inner edge of the orange patch; costal margin reddish, with the usual minute black dot at the end of the cell. Secondaries entirely reddish-buff, thickly covered with striations of greyish-brown; the usual discal band indicated by two spots of dusky brown on the costal margin; a third spot visible above the second median nervule, but somewhat fainter towards the inner margin; the base of the wing dusky brown, the nervules terminating in minute black dots; the usual small spot at the end of the cell encircled by orange.

Expanse 1·3 inches. (*Spec. ex Natal; E. C. Buxton; Mus. Brit.; Type of T. halyattes.*)

“DRY-SEASON” FORM OF FEMALE.—Very similar to that of the “wet-season” form (fig. 2b), but with the orange patch on the primaries nearly obliterated by the larger expanse of brownish-black; the spots and markings not otherwise different. Secondaries with the brownish patch on the apex somewhat more divided by white streaks; two distinct dusky spots visible, one on the costal margin, and the second situated between the radial and median nervules indicating a faint discal line; otherwise the general appearance is very similar to fig. 2b.

Underside.—Primaries whitish, the apical area sandy-buff, with the brownish band on the inner edge strongly marked; a dusky twin-spot visible on the inner margin above the sub-median nervure. Secondaries entirely sandy-buff thickly sprinkled with brownish dustings; the brownish spots and markings more strongly marked than in the male (fig. 2d), the discal band being nearly complete.

Expanse 1·2 inches. (*Spec. ex Natal; E. C. Buxton; Mus. Brit.; Type of T. lycoris.*)

HABITAT.—South Africa. Orange River (*C. H. Pilcher; Mus. Brit.; cf. Trimen, t.c. p. 157*). Kimberley (*Godman-Salvin Coll.; Mus. Brit.*). Damara Land (*De Vylder; cf. Trimen, t.c. p. 157*).

GRIQUA LAND WEST.—Vaal River (*J. H. Bowker and H. J. Feltham; cf. Trimen, t.c. p. 157*).

North-East Transvaal and Mashona Land (*C. H. Barker; Trimen Coll.*).

North-East Natal (*E. C. Buxton; Mus. Brit.; cf. Trimen, t.c. p. 140*).

The type of this species is in the British Museum, labelled “South Africa.” Dr. Trimen informs us that it is from the “Orange River,” where it was collected by Mr. C. H. Pilcher. It seems to have formed part of a collection obtained by this

gentleman, and purchased by the Museum from Mr. Janson, with the somewhat comprehensive localities of "Orange River, Diamond Fields and Transvaal," an area, as we have learnt through the bitter experience of our war with the Boers, of somewhat wide extent. The locality "Orange River" of 1889, when Dr. Trimen wrote, is now "South Africa," and we may therefore dismiss the original locality as unproven. A specimen from Kimberley is in the Godman-Salvin collection, and Dr. Trimen mentions the occurrence of the species in Damara Land. Thence it appears to extend to the eastward into Griqua Land, north to the Eastern Transvaal and Mashona Land. Specimens are in the British Museum from N.E. Natal, collected by that splendid old example of a British naturalist, the late E. C. Buxton, and these were no doubt obtained on his expedition to Santa Lucia Bay.

Mr. Guy Marshall writes of *T. lais*: "This is a distinct little species of the *T. achine* group from S.W. Africa, and may be distinguished from its allies by the small, very oblique, orange apical patch, which has a distinct border of black along its inner edge. I have only seen dry-season specimens." Of *T. halyattes* he says: "This little species is at present known only from N.E. Natal and the Transvaal, but it seems to be very scarce, and only dry-season specimens have been captured. It combines several characters of the dry forms of *T. achine* (Cram.) and *T. evippe* and *T. omphale*, but is nearer the former. The females in the British Museum, which appear to have been selected by guess-work, are quite similar to those of *T. achine* (dry)."

Dr. Butler's notes on this species are as follows: "The female of *T. lais*, the wet- (not dry-) season form, bears a vague resemblance to that of the *T. etrida*, var. *T. bimbura*, but the orange sub-apical bar has no inner blackish edging and there is no spot on the second median areole of the primaries; the two marginal spots nearest to the apex of the secondaries are also confluent; on the under surface the basal area and the apical border of the primaries and the secondaries, with the exception of a discal patch towards the apex, are washed with pale buff; the orange sub-apical curved bar of the primaries is paler than above, but the interno-median black spot is distinct. The males vary greatly in expanse, the type measuring about 34 mm., and a second example from the Godman and Salvin collection no less than 46. It approaches *T. ephyia*, but has more nearly the upper-surface pattern of *T. bimbura*, with pure white under surface (indistinctly irrorated with black scales when examined through a lens), the disco-cellular dots black, that of the secondaries attached to an orange spot; the costa of these wings is also narrowly orange towards the base.

"My incorrect identification of the sexes of the dry-season form (*T. halyattes*) led Mr. Marshall into error. The male of the latter is much like the wet-season form above, but both sexes below are alike, with grey specked rosy apical area to the

primaries and rosy secondaries, showing traces of an angular discal series of dusky spots, one or two of which are more or less prominent on the upper surface of the female; the apical patch in this sex is dark brown, with a curved sub-apical series of indistinct orange spots."

It will be seen that Dr. Butler unites *T. lais* and *T. halyattes* together. They are however, kept as distinct species by Dr. Trimen and Mr. Guy Marshall, and, as far as the evidence goes, I am inclined to agree with the two latter Lepidopterists.

Of the large variety A, Dr. Trimen writes: "that four examples (two of each sex) were taken by Col. Bowker on the Vaal River in 1871, but no note accompanied them except the general one (since confirmed by Mr. Feltham) that in that tract of country all the *Teracoli* were almost confined to the immediate vicinity of the river."

EXPLANATION OF THE FIGURES OF *T. lais*.

- Plate 35, fig. 2. ♂ Kimberley (*Godman-Salvin Coll.*; *Mus. Brit.*).
 „ 2a. Natal (*E. C. Buxton*; *Mus. Brit.*: underside).
 „ 2b. ♀ South Africa (*Godman-Salvin Coll.*; *Mus. Brit.*).
 „ 2c. ♂ Natal (*E. C. Buxton*; *Mus. Brit.*).
 „ 2d. Underside of fig. 2c.
 „ 2e. ♀ Natal (*E. C. Buxton*; *Mus. Brit.*).
 „ 2f. Underside of fig. 2e.

TERACOLUS PALLENE (Hopffer).

(Plate 36, figs. 1, 1a, 1h.)

Anthocharis pallene, Hopff. M.B.K. Akad. Berlin, 1855, p. 640; *id.* in Peters's Reise Mossamb. Ins. p. 358, pl. 23, figs. 7, 8 (1862).

Callosune pallene, Kirby, Syn. Cat. Diurn. Lepid. p. 504 (1871).

Callosune pseudetrida, Westwood, in Oates' Matabele Land, App. p. 340 (1881); (*ed.* 2), p. 347 (1889).

Teracolus pallene, Guy Marshall, P.Z.S. 1897, p. 34; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 458 (1897).

Teracolus cinctus, Butler, Ann. and Mag. Nat. Hist. (5) xii. p. 105 (1883).

Allied to *T. lais*, but distinguished from that species by the much darker appearance of both wings, and the distinct blackish band along the inner margin of the primaries. The females are also much more heavily marked than in *T. lais*.

MALE. Primaries.—Central area creamy-white, the orange-red apical patch larger and brighter in colour, enclosed on the inner edge by a narrow line of brownish-black, which unites with the broad hind-marginal border; costal margin narrowly edged with black; a dusky line extending from the base along the inner

margin to about the centre of the wing and then diverging upwards; this dark marking and the entire base thickly sprinkled with grey; the usual minute black dot visible at the end of the cell. Secondaries with the entire wing creamy-white; a distinct broad border of brownish-black on the hind margin; the base of the wing thickly dusted with grey.

Underside.—Primaries white, the apical area yellow, relieved by four spots of orange, the nervules terminating in minute black dots on the hind margin; near the centre of the wing, between the sub-median nervure and the first median nervule, is situated a large brownish spot, and a faint dusky line extends along the margin to the base of the wing. Secondaries creamy-white, the nervules terminating in minute black dots on the hind-margin; on the discal area an incomplete band of reddish-brown spots, situated between the veins, the largest spot at the end of the costal nervure, two spots between the third median nervule and the first radial nervule, the fourth spot visible between the sub-median nervure and the first median nervule; a distinct streak of orange on the costal margin, also an orange spot relieved by a black dot at the end of the cell; a faint brownish dusting along the inner margin.

Expanse 1·6 inches. (*Spec. ex Victoria Nyanza; Bishop Hannington; Mus. Brit.; Type of T. pseudetrida.*)

FEMALE.—Primaries whitish; the base, inner margin, hind margin and apical area brownish-black, the latter relieved by five distinct reddish spots; the broad band on the inner margin not uniting with the hind-marginal border. Secondaries with the central area white; the costal and hind margins heavily bordered with brownish-black; the hind-marginal border relieved by a post-median row of white spots, a dusting of brownish-grey on the inner margin, almost limiting the white area to one large spot.

Underside.—Primaries whitish, the apical area orange-yellow, the base light greenish-yellow; the broad brownish line strongly pronounced on the inner margin. Secondaries whitish, with a distinct reddish-buff line traversing the discal area, and a greenish shading on the hind margin; the usual disco-cellular spot at the end of the cell distinctly visible, as well as the orange streak on the costal margin.

Expanse 1·3 inches. (*Spec. ex Mpondas, Nyasa Land, April 18, 1899; E. M. de Jersey; Mus. Brit.; Type of T. pseudetrida.*)

A second form of the female has the blackish-brown markings more heavily pronounced, and the orange spots on the apical area of the primaries almost obsolete, a faint streak uniting the inner marginal line to the hind margin.

Underside.—Similar to that of the female above described, but richer in colour, the ground-colour of the secondaries yellowish-white; the reddish line crossing the discal area very strongly marked, the base greenish-yellow.

Expanse 1·3 inches. (*Spec. ex Mpondas, Nyasa Land, April 18, 1899; E. M. de Jersey; Mus. Brit.; sub nom. T. pseudotrifa.*)

“INTERMEDIATE” FORM OF MALE.—Very similar to that of the “wet-season” form, the black markings, especially on the inner margin of the primaries, being much reduced.

Underside.—Primaries similar to those of the male figured above (fig. 1a). Secondaries pale buff, the transverse band on the discal area more broken up into spots.

Expanse 1·1 inches. (*Spec. ex Victoria Nyanza; Bishop Hannington; Mus. Brit.; sub nom. T. cinctus.*)

“INTERMEDIATE” FORM OF FEMALE.—Resembling the female above described, the brownish-black markings less intensified, the apical area on the primaries having a suffusion of orange-red, instead of the usual distinct spots.

Underside.—With the exception of the ground-colour of the secondaries being rather deeper sandy-buff, the spots and markings of both wings agree with those of the female (fig. 1a.)

Expanse 1·4 inches. (*Spec. ex Victoria Nyanza; G. F. Scott-Elliott; Mus. Brit.*).

“DRY-SEASON” FORM OF MALE.—Primaries creamy-white, an almost obsolete line of greyish speckling being visible on the inner margin; the orange-red patch on the apical area somewhat more yellow in colour, the inner transverse line of black strongly marked to as far as the second median nervule, after which it is only faintly indicated. Secondaries entirely creamy-white, the nervules terminating in blackish spots on the hind margin, with a slight dusting of grey at the base.

Underside.—Ground-colour whitish; the apical area light orange-yellow, with greyish dustings, the dusky spot on the inner margin only faintly visible. Secondaries sandy-pink, with faint greyish specklings; the usual minute black dots visible at the end of the cell.

Expanse 1·2 inches. (*Spec. ex Loangwa River, Nyasa Land, September 5, 1895; R. Crawshaw; Mus. Brit.; sub nom. T. cinctus.*)

“DRY-SEASON” FORM OF FEMALE.—Primaries whitish; the brownish-black apical area much reduced and showing a very faint suffusion of orange-red; the dark portion of the wing edged on the inner side with the faintest line of pale yellow; the base and the inner margin brownish-black, this colour terminating along the latter in a blackish spot near the posterior angle. Secondaries entirely whitish; the usual broad hind-marginal border reduced to a series of small nervular spots, rather larger towards the apical area; an extra spot visible above the third median nervule.

Underside.—Primaries whitish; the apical area yellowish-buff, thickly sprinkled with grey, with an inner line, consisting of three minute spots. Secondaries

entirely sandy-buff, with greyish specklings, the dark spots situated above the third median nervule strongly marked.

Expanse 1.1 inches. (*Spec. ex Loangwa River, Nyasa Land, September 13, 1895; R. Crawshay; Mus. Brit.; sub nom. T. cinctus.*)

HABITAT.—Namaqua Land (*teste* Guy Marshall, P.Z.S. 1897, p. 34). Matabele Land, Tati (*F. Oates; cf. Westwood; App. Oates' Matabele Land, p. 340, 1881.*)

ZAMBESI DISTRICT.—Tete (Hopffer, in Peters's *Reise Mozamb. Ins.*, p. 358, pl. 23, figs. 7, 8, 1862).

NYASA LAND.—Mpondas, Matope (*E. M. de Jersey; Mus. Brit.*). Loangwa River, Senga (*R. Crawshay; Mus. Brit.*).

EQUATORIAL AFRICA.—Victoria Nyanza (*Bishop Hannington; G. F. Scott-Elliott; Mus. Brit.*).

This species is evidently allied to *T. lais*, and differs only in the characters which I have stated above. It ranges from Namaqua Land across Matabele Land and the Zambesi region, and thence north to Nyasa Land and the Lake Districts. Bishop Hannington and Mr. Scott-Elliott have procured specimens in the neighbourhood of the Victoria Nyanza, but in the many collections which I have received from my friend Mr. F. J. Jackson I have not seen any examples of this species from Equatorial Africa. Dr. Butler considers *T. pseudetrida* to be identical with *T. pallene*, but Mr. Guy Marshall thinks that it is a form of *T. evagore*. He writes: "This species differs chiefly from *T. evagore* in having a continuous black border along the inner edge of the apical patch at all seasons. I have seen specimens from Nyasa Land, Namaqua Land, and South Matabele Land."

Dr. Butler, in his revision of the genus *Teracolus*, observes as follows: "I believe that the species mentioned in my synonymy are identical, although the description of the under surface of Westwood's type of *T. pseudetrida* does not correspond in every detail with that of *T. cinctus*, and the female is described as having a sub-apical yellow fascia, whilst the female of *T. cinctus* has the apical area black, crossed by ill-defined narrow ochreous dashes. Still, I believe that variation may account for these discrepancies. One thing is certain, that Westwood's insect must belong to the *T. दौरα* group, and not to the singular mixed community in which Mr. Marshall has placed it, for it undoubtedly has the orange apical patch of the male, black-bordered internally. Assuming that my synonymy is correct, the species must be intermediate between *T. lais* and *T. infumatus*, and must range from the Victoria Nyanza southward to Nyasa Land, and thence to Tete on the Zambesi. The intermediate form has the under surface washed with warm buff, and the dry-season form is small, with narrow black borders, the black internal streak ill-defined, and the secondaries rosy on the underside."

EXPLANATION OF THE FIGURES OF *T. pallene*.

- Plate 36, fig. 1. ♂ Victoria Nyanza (*Bishop Harrington; Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Mpondas, Nyasa Land (*E. M. de Jersey; Mus. Brit.*).
 „ 1c. ♀ Mpondas, Nyasa Land (*E. M. de Jersey; Mus. Brit.*).
 „ 1d. Underside of fig. 1c.
 „ 1e. ♂ Loangwa River, Nyasa Land (*R. Crawshaw; Mus. Brit.*).
 „ 1f. Underside of fig. 1e.
 „ 1g. ♀ Loangwa River, Nyasa Land (*R. Crawshaw; Mus. Brit.*).
 „ 1h. Underside of fig. 1g.

TERACOLUS INFUMATUS (Butler.)

(Plate 36, figs. 2, 2a-2e.)

Teracolus infumatus, Butler, P. Z. S. 1896, p. 128, pl. vi. figs. 5, 6; Guy Marshall, P. Z. S. 1897, p. 30; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 458 (1897); Aurivillius, Rhop. Æthiopica, p. 435 (1898).

Distinguished from *T. pallene* by the brownish-black borders of the wings, and by having the markings much darker in colour and much broader than in the former species. The female is also much darker and more heavily marked.

“WET-SEASON” FORM OF MALE.—Central area of the primaries white; the orange-red apical patch somewhat narrower than in *T. pallene*, and enclosed by a broad brownish-black transverse line; the hind margin brownish-black, extending along the costal margin, but much reduced in breadth; a broad blackish line along the inner margin, but not uniting with the broad transverse line, as in *T. pallene*, the base dark, dusted with grey; the black spot at the end of the cell somewhat larger. Secondaries whitish, a broad brownish black border on the hind margin, this colour also visible at the base and along the costal margin.

Underside.—Primaries white, the apical area orange-yellow, shaded on the apex and hind margin with greenish-yellow, the broad blackish line evident on the inner margin. Secondaries whitish, with greyish specklings on the hind and inner margins; an orange streak along the costa; at the end of the cell an orange spot, relieved by a small black dot.

Expanse 1.5 inches. (*Spec. ex Henga, West of Lake Nyasa, January 24, 1895; R. Crawshaw; Mus. Brit.; Type of Species.*)

FEMALE.—Primaries brownish-black, the costal area and half of the discal area white; a large white spot at the posterior angle; the broad line on the inner margin united to the dark apical portion by a thin brownish line, thus forming the white spot on the posterior angle; the apical area relieved by five spots of orange-yellow

more or less strongly marked; the black disco-cellular spot large. Secondaries with the central area whitish, the base, costal and hind margins brownish-black, the latter very broad, relieved by faint streaks of white, and united to the costal border by a narrow brownish line, thus enclosing two white hastate spots near the posterior angle; a dusky shading visible along the inner margin.

Underside.—Costal and discal areas of the primaries white; the apical area brilliant orange, surrounded by a greenish-yellow shading; the blackish-grey marking along the inner margin strongly indicated; the nervules terminating in minute black dots on the hind margin. Secondaries with the discal area whitish; the basal area and hind margin yellowish-buff, a nearly complete discal line of orange traversing the wing; the orange costal streak and discoidal spot strongly pronounced.

Expanse 1·4 inches. (*Spec. ex Henga, West of Lake Nyasa, January 30, 1895; R. Crawshay; Mus. Brit.; Type of Species.*)

“DRY-SEASON” FORM OF MALE.—Very similar to the “dry-season” form of *T. pallene* (fig. 1e), but with the black hind-marginal border rather more strongly pronounced and terminating in a black spot above the first median nervule; the inner marginal line indicated by a grey shading which is almost obsolete. Secondaries not differing from those of *T. pallene*.

Underside.—Similar to that of *T. pallene* (fig. 1f), the secondaries showing no specklings over the sandy-pink ground-colour; the nervules terminating in minute black dots on the hind margin, and the discoidal spots very small.

Expanse 1·3 inches. (*Spec. ex Nyasa Land; Consul Alfred Sharpe; Mus. Brit.*)

HABITAT.—Nyasa Land and Lake Tanganyika.

NYASA LAND.—(*Consul Alfred Sharpe; Mus. Brit.*). Henga, West of Lake Nyasa (*R. Crawshay; Mus. Brit.*).

Niomkola, Lake Tanganyika (*A. Carson; Mus. Brit.*).

According to Dr. Butler, no “intermediate” forms of this species are yet known, nor has the “dry-season” female been recognised.

T. infumatus, at the first glance, resembles the West African *T. evippe*, but on a closer inspection some apparently distinctive characters can be detected, and I therefore follow the opinions of Dr. Butler and Prof. Aurivillius in keeping this form distinct; and Mr. Guy Marshall is also of the same opinion.

The last-named gentleman writes: “This is a very distinct little species, of which there are two males and two females in the British Museum, from Lake Tanganyika and Lake Nyasa. The general pattern of the black markings in the male is not unlike that of a very heavily-marked *T. achine* (Cram.), but the apical patch is dis-

tinctly of the *T. evippe* type. The female is very like that of the latter insect, but exhibits some of the characters of *T. achine*. Mr. Guy Marshall alludes to a specimen in my collection, but at the time of writing I cannot find the specimen referred to from the Victoria Nyanza, though I have many from various West African localities. The latter, however, are all *T. evippe*, nor is there any specimen from the Victoria Nyanza in Mr. F. J. Jackson's collection, so I think that the specimen mentioned by Mr. Guy Marshall must have been seen by him in some other collection than my own.

Dr. Butler follows Mr. Guy Marshall in assigning the Victoria Nyanza district as a locality for this species; but there are no specimens in the British Museum, and, from the present evidence at our disposal, this locality requires further confirmation.

Dr. Butler makes the following remarks: "This species in its wet-season form is like a large and very heavily marked form of *T. pallene*, to which it is undoubtedly allied; but the intermediate-season form (of which we have a male from Lake Tanganyika) has the apical patch of orange more extended on the costa and not bordered internally by a black bar. This fact brings the species somewhat nearer to the *T. दौरа* group, in which the dry-season form has a similar character."

EXPLANATION OF THE FIGURES OF *T. infumatus*.

- Plate 56, fig. 2. ♂ Henga, W. of Lake Nyasa (*R. Crawshay*; *Mus. Brit. Type of species*).
 „ 2a. Underside of fig. 1.
 „ 2b. ♀ Henga, W. of Lake Nyasa (*R. Crawshay*; *Mus. Brit. Type of species*).
 „ 2c. Underside of fig. 1b.
 „ 2d. ♂ Nyasa Land (*A. Sharpe*; *Mus. Brit.*).
 „ 2e. Underside of fig. 1d.

TERACOLUS DAIRA (Klug).

(Plate 37, figs. 1, 1a-1o.)

- Pontia दौरа*, Klug, *Symb. Phys.* pl. viii. figs. 1-4 (1829).
Anthocharis दौरа, Boisd. *Sp. Gén.* i. p. 579 (1836).
Anthocharis nouna, Lucas, *Expl. Algeria Zool.* iii. p. 350, pl. i. fig. 2 (1869).
Anthopsyche demagore, Feld.; *Reise Novara Lepid.*, p. 186 (1865).
Anthopsyche dalila, Feld. *t.c.*, p. 188 (1865).
Anthopsyche stygia, Feld., *t.c.*, p. 188 (1865).
Callosune nouna, Kirby, *Syn. Cat. Diurn. Lepid.* p. 503 (1871).
Callosune demagore, *id. t.c.*, p. 503 (1871).
Callosune dalila, *id. t.c.*, p. 503 (1871).
Callosune दौरа, *id. t.c.*, p. 503 (1871).

Callosune stygia, *id. t.c.*, p. 503 (1871).

Teracolus xanthus, ♀. Swinhoe, P. Z. S. 1884, p. 440, pl. xxxix. fig. 11.

Teracolus odysseus, ♂. Swinhoe, *t.c.* p. 441, pl. xl. fig. 3.

Teracolus dalila, Guy Marshall, P. Z. S. 1897, p. 34.

Teracolus stygia, Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 459 (1897).

Teracolus दौरα, Butler, P. Z. S. 1896, p. 247; Guy Marshall, P. Z. S. 1897, p. 34; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 459 (1897); Aurivillius, *t.c.*, p. 435 (1898).

Teracolus liagore, Butler, P. Z. S. 1899, p. 812.

Distinguished from *T. infumatus* by the ground-colour having a more creamy appearance, the orange apical band narrower, and the usual black discoidal spot entirely absent, this being the case in both sexes. The females have the ground-colour more or less sulphur-yellow, but with all the markings as in the males, while the orange apical spots are always obsolete.

MALE.—Central area of the primaries creamy-white; the apical area brownish-black, relieved by a narrow row of five orange-red spots, much pointed on both sides; the dark hind-marginal border terminating above the first median nervule; the costal margin grey, with a brownish-black line along the inner margin, the basal half being thickly sprinkled with grey. Secondaries entirely creamy-white; the brownish-black hind-marginal border considerably relieved with white near the anal angle; above the marginal border, extending over the first, second and third median nervules, is a brownish-grey shading; the costal margin brownish-black, with the extreme base grey.

Underside.—The discal area of the primaries white, extending to the posterior angle; the base and discoidal cell pale yellow, the orange apical patch surrounded by a light green shade which extends along the costa to the base, this colour sprinkled all over with a dusting of grey; the dark line on the inner margin well pronounced. Secondaries creamy-white, with a broad greyish-green hind-marginal border which graduates towards the apex; a deep orange streak on the costal margin; a small spot of the same colour visible at the end of the cell, and relieved by a minute black dot.

Expanse 1·4 inches. (*Spec. ex Zeila, Somali Land; June 4, 1895; Capt. Nurse; Mus. Brit.; sub nom. T. दौरα.*)

FEMALE.—Primaries pale yellow, the apical area brownish-black to as far as the first median nervule; a very pronounced and broad brownish line along the inner margin, thickly sprinkled with grey, this line united to the apical patch by a thin dusky line. Secondaries pale yellow, the base and costal margin brown, dusted with grey; the upper half of the hind-marginal border brownish-black, the lower half, towards the inner margin, divided and sprinkled with grey; the nervules terminating in brown.

Underside.—Very similar to that of the male (fig. 1a), excepting that the ground-colour of the secondaries is pale yellow, instead of white.

Expanse 1·4 inches. (*Spec. ex Zeila, Somali Land; June 4, 1895; Capt. Nurse; Mus. Brit.*)

A second form of the female is very similar to the one fully described above, the differences being the sulphur-yellow ground-colour of both wings and the somewhat narrower brownish-black apical patch on the primaries. The underside does not differ as regards the spots and markings, but the ground-colour is deeper yellow.

Expanse 1·3 inches. (*Spec. ex Zeila, Somali Land, May 28, 1895; Capt. Nurse; Mus. Brit.; T. stygia.*)

“INTERMEDIATE” FORM OF MALE.—Central area of the primaries creamy-white, the orange-red apical patch broader, and extending over the black transverse band towards the costal margin; the dark line along the inner margin only indicated by a faint dusky spot near the posterior angle. Secondaries with the hind-marginal border somewhat narrower, and showing more white towards the anal angle.

Underside.—Ground-colour of both wings more greenish-yellow; a blackish spot strongly indicated near the posterior angle. Secondaries showing a distinct olive-green line in place of the usual shading on the hind-margin, a spot of the same colour being also visible near the end of the costal nervure.

Expanse 1·3 inches. (*Spec. ex Zazafe River, White Nile; Capt. H. N. Dunn; Mus. Brit.; T. stygia.*)

“INTERMEDIATE” FORM OF FEMALE.—Excepting that the brownish-black markings on both wings are much reduced in size, especially on the inner margin of the primaries, specimens agree with fig. 1d both on the upper and under surface.

A second form has the ground-colour of both wings sulphur-yellow; the brownish-black apical patch on the primaries suffused with deep yellow on the inner side; the dark line on the inner margin faintly indicated with reddish-buff; the nervules terminating in brownish spots on the hind margin, the apical spots being the largest.

Underside.—Central area yellowish-white, the base darker; the orange band lined on the apex and hind margin with yellowish-buff; a faint buff spot and line visible along the inner margin. Secondaries entirely sandy-yellow; the hind-marginal border darker; a faint reddish-buff spot at the end of the costal nervure.

Expanse 1·6 inches. (*Spec. ex “Upper Egypt”; Consul Petherick; Mus. Brit.; one of the types of T. xanthus, Swinhoe.*)

“DRY-SEASON” FORM OF MALE.—Primaries white, with a large orange-yellow patch covering the whole of the apical area; the nervules faintly streaked with black on the hind margin, but not below the first median nervule. Secondaries

entirely white; the nervules terminating in small brownish spots on the hind margin.

Underside.—Central area of the primaries white; apical area yellow, relieved by three streaks of orange-red. Secondaries entirely white.

Expanse 1·6 inches. (*Spec. ex loc.ign.*; *Salvin-Godman Coll.*; *Mus. Brit.*; *T. Liagore*.)

“DRY-SEASON” FORM OF FEMALE.—Primaries yellowish-white, the basal area greenish-grey; the orange-red apical patch relieved by a post-median line of brown; the nervules to as far as the first median nervule terminating in small black spots on the hind margin; a greyish spot situated between the sub-median nervule and the first median nervule. Secondaries pinkish-white, the hind-marginal border brownish, with the commencement of a brown discal line visible at the end of the costal nervule.

Underside.—Central area of the primaries whitish, the base yellowish-green; the orange-red band very bright; the apex more yellow; a dusky spot situated near the posterior angle. Secondaries sandy-pink; the hind-marginal border deeper in colour and tinged with a green shading on the extreme edge; the discal line near the apex also strongly marked; the usual orange streak visible along the costal margin.

Expanse 1·3 inches. (*Spec. ex Muscat, Arabia*; *Lieut.-Colonel Jayakar*; *Mus. Brit.*; *T. Liagore*.)

A second form of the “dry-season” male is much smaller; the orange-yellow apical patch not so brilliant in colour, and the black on the hind-marginal border slightly more pronounced.

Underside.—The basal area of the primaries and the ground-colour of the secondaries pale yellow.

Expanse 1·1 inches. (*Spec. ex White Nile*; *Consul Petherick*; *Mus. Brit.*; *T. demagore*.)

The second form of the “dry-season” female has the black hind-marginal border and the post-median line yellowish-brown; no shading visible at the base; the secondaries white with brownish nervular spots on the hind margin.

Underside.—Central area of the primaries white; the base pale yellow; the apical area yellowish-buff, relieved by a post-median line of dusky spots, with a similar spot situated near the posterior angle. Secondaries entirely yellowish-buff with slightly darker markings.

Expanse 1·3 inches. (*Spec. ex White Nile*; *Consul Petherick*; *Mus. Brit.*)

HABITAT.—Algeria to Egypt, the Upper Nile districts, and Somali Land; also the countries bordering the Red Sea and ranging to Muscat in Eastern Arabia.

Algeria (Lueas, *Expl. Alger. Zool.* iii. p. 350, pl. i., fig. 2, 1849). Shela

Mountain, near Suakin, February (*A. J. Chalmley*; *E. M. Sharpe*, *P. Z. S.* 1897, p. 776). "Upper Egypt" (*Consul Petherick*; *Mus. Brit.*).

UPPER WHITE NILE.—Gabt-el-Neeghalid, Zараfe River (*Capt. H. N. Dunn*; *Mus. Brit.*). Bogos Land (*Mus. Rothschild*; type of *T. stygia*). Anseba Valley, Waliko (*Jesse*; *Godman-Salvin Coll.*; *Mus. Brit.*).

SOMALI LAND.—Zeila, May and June (*Capt. Nurse*; *Mus. Brit.*; *Butler*, *P. Z. S.* 1896, p. 254). Hammer, Wardi, February; Dara-as, March (*Mrs. Lort-Phillips*; *E. M. Sharpe*, *P. Z. S.* 1896, p. 528).

ARABIA.—Muscat (*Lieut.-Colonel Jayakar*; *Mus. Brit.*; *Butler*, *P. Z. S.* 1899, p. 812).

This species belongs to a distinct group, which includes also *T. heuglini* and *T. evagore*.

Dr. Butler and Mr. Guy Marshall agree fairly well concerning the synonymy of this species, excepting that the latter gentleman considers *T. demagore* to be identical with *T. ephyia* instead of with *T. दौरа*, and *T. nouna* to be the same as *T. evagore*. Dr. Butler tells me that he now regards *T. stygia* as identical with *T. दौरа*, and he believes that the latter is really identical with *T. liagore*, which I have placed as a synonym of *T. evarne* (*vide antea*, p. 90). In this I followed Dr. Butler's latest arrangement of the genus; and if *T. liagore* really belongs to the *T. दौरа* group, and is identical with the last-named species, then the latter name will have to be suppressed and that of *T. liagore* adopted.

The type of *T. stygia* of Felder, from Bogos Land, has been kindly lent to me by the Hon. Walter Rothschild; it is, according to Dr. Butler, an "intermediate seasonal" form. I agree with Dr. Butler that it is identical with *T. दौरа*, and he has since identified several specimens in the British Museum from Zeila, collected by Capt. Nurse, as being *T. stygia*, and not to be separated specifically from *T. दौरа*. Again, owing to Mr. Rothschild's kindness, I have been able to examine all the Felder types, and I find that *T. demagore* is a very "dry" form, having the black apical spots more distinctly indicated, also a grey dusting along the inner margin. The specimens in the National collection do not quite agree with the type.

Dr. Butler writes: "The type of Felder's *T. dalila* is identical with the typical wet-season form. *T. odyssens* is an intermediate form, and *T. nouna* (of which *T. demagore* is a synonym) is the dry-season form. The latter, owing to its resemblance in the male sex to the dry-season forms of two other allied species, has been united to them and placed in the next group of species by Mr. Guy Marshall."

Mr. Guy Marshall observes: "The male seems to hold an intermediate position between *T. gerburii* and *T. thruppi*, but the female is very distinct from that of any

other species. In defining *T. xanthus* and *T. odysseus*, Colonel Swinhoe has undoubtedly confused the sexes of two species, for the male *T. odysseus* clearly belongs to the female *T. xanthus*, and in my opinion they constitute the dry-season form of *T. दौरा*. Moreover, the male *T. xanthus* and the female *T. odysseus* are referable to one species—viz. the variable *T. evagore* (Klug)."

EXPLANATION OF THE FIGURES OF *T. दौरा*.

- Plate 37, fig. 1. ♂ Zeila, Somali Land (*Capt. Nurse; Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Zeila, Somali Land (*Capt. Nurse; Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀ Zeila, Somali Land (*Capt. Nurse; Mus. Brit.*).
 „ 1e. ♂ Zarafe River, White Nile (*Capt. H. N. Dunn; Mus. Brit.*).
 „ 1f. Underside of fig. 1e.
 „ 1g. ♀ Zarafe River, White Nile (*Capt. H. N. Dunn; Mus. Brit.*).
 „ 1h. Underside of fig. 1g.
 „ 1i. ♀ "Upper Egypt" (*Consul Petherick; Mus. Brit.*).
 „ 1j. ♂ *Log. ign.* (*Salvin-Godman Coll.; Mus. Brit.*).
 „ 1k. Underside of fig. 1j.
 „ 1l. ♀ Museut, Arabia (*Lieut.-Col. Jayakar; Mus. Brit.*).
 „ 1m. Underside of fig. 1l.
 „ 1n. ♂ White Nile (*Consul Petherick; Mus. Brit.*).
 „ 1o. ♀ White Nile (*Consul Petherick; Mus. Brit.*).

TERACOLUS HEUGLINI (Felder).

(Plate 38, figs. 1, 1a-11.)

Anthopsyche heuglini, Felder, Wien. ent. Monaschr. iii. p. 272 (1859); *id.* Reise, Novara Lepid. p. 185, pl. 25, fig. 4 (1865).

Callosune heuglini, Kirby, Syn. Cat. Diurn. Lepid. p. 503 (1871).

Teracolus thruppi, Butler, P. Z. S. 1885, p. 771, pl. xlvii. fig. 10; *id.* P. Z. S. 1894, p. 577; Guy Marshall, P. Z. S. 1897, p. 34; E. M. Sharpe, P. Z. S. 1898, p. 370.

Teracolus jamesi, Butler, P. Z. S. 1885, p. 771; *id.* P. Z. S. 1896, p. 254.

Teracolus jacksoni, E. M. Sharpe, Ann. and Mag. Nat. Hist. (6) vi. p. 336 (1890); Waterhouse, Aid, pl. 189, fig. 3 (1890); Holland, Proc. U. S. Nat. Mus. xviii. p. 762 (1895); E. M. Sharpe, P. Z. S. 1896, p. 535.

Teracolus heuglini, Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 459 (1897); Aurivillius, Rhop. Æthiop. p. 435 (1898).

Teracolus heuglini, var. *T. thruppi*, Butler, P. Z. S. 1897, p. 693 (1898), p. 409.

Teracolus heuglini, var. *jacksoni*, Butler, P. Z. S. 1898, p. 409.

Allied to *T. दौरा*, but at once distinguished by the black markings on both wings being much more heavily indicated, especially the line along the inner margin

of the primaries, which also unites with the hind-marginal line in both sexes. The females also show the same characters and some forms show the orange line on the apical area of the primaries.

MALE.—Central area of the primaries creamy-white, the apical area and hind margin heavily marked with brownish-black; a band consisting of six orange spots, more or less spear-shaped and somewhat pinker in colour than in *T. दौरा*, relieving the black on the apical area; the broad black line along the inner margin suffused with grey near the base; a white spot visible near the posterior angle; the cilia white at this point and not at the extreme apex. Secondaries with the central area of the wing creamy-white; the extreme base, costal margin and hind margin broadly bordered with brownish-black, the latter only faintly streaked with white; the cilia white.

Underside.—The general aspect of both wings similar to those of *T. दौरा* as regards colour and markings, with the exception that all the markings are more heavily indicated.

Expanse 1.3 inches. (*Spec. ex Rabai Hills, July 1889; F. J. Jackson Coll. Type of T. Jacksoni.*)

FEMALE.—Very similar to that of the male described above as regards the brownish-black borders on both wings; the orange spots on the apical area of the primaries more of an orange-yellow colour than in the male, the ground-colour sulphur-yellow instead of white, somewhat more reduced, and with a second spot visible above the usual one at the posterior angle.

Underside.—Very similar to that of the female of *T. दौरा* as regards colour and markings; the orange band and the black line along the inner margin, wider and more heavily indicated; the green shading also less yellow in colour.

Expanse 1.2 inches. (*Spec. ex Witu, May 1891; F. J. Jackson Coll.*)

A second form of the female, which I have figured, is very like the female of *T. दौरा* (1d) in the general colour of both wings. The brownish-black apical patch on the primaries is somewhat larger, and the orange-red spots nearly obsolete; a very thin line unites the hind-marginal border to the darker inner-marginal line in this form, this line being entirely absent in *T. दौरा*. The broad blackish border on the secondaries somewhat more relieved with sulphur-yellow spots than in the female (fig. 1b). With the exception that the ground-colour is more yellowish-buff, the spots and markings agree with those of fig. 1e.

Expanse 1.3 inches. (*Spec. ex Karamoja, November, Capt. Diver; E. M. Sharpe Coll.*).

“INTERMEDIATE” FORM OF MALE.—Very similar to the “wet-season” form, but the primaries not quite so elongated, the black along the inner margin is not united

to the hind-marginal border, and the orange-red spots are slightly broader and consist of five distinct spots instead of four. Secondaries with the dark hind-marginal border less developed, and showing more white towards the anal angle.

Underside.—With the exception that all the green shading on the hind-margins of both wings is browner, this form agrees with the male above described (fig. 1a).

Expanse 1·2 inches. (*Spec. ex Somali Land, J. G. Thrupp; Mus. Brit. Type of T. thruppi.*)

“INTERMEDIATE” FORM OF FEMALE.—Central area of the primaries yellowish-white; the apical area brownish-black, as well as the hind-marginal band, to as far as the first median nervule; a broad line strongly indicated along the inner margin, but disconnected from the hind margin; four orange-red spots crossing the dark apical area. Secondaries yellowish-white, with two strongly marked brown spots near the posterior angle, followed by three smaller nervular spots on the hind margin, about the discal area a greyish-brown patch visible.

Underside.—Similar to that of the male, the greenish markings thickly speckled with grey.

Expanse 1·1 inches. (*Spec. ex Somali Land; Mus. Brit. Type of T. thruppi.*)

A second form of the female resembles that of the “wet-season” (fig. 1d) as regards spots and markings, the ground-colour being white instead of pale yellow. The underside very similar to fig. 1e, the ground-colour somewhat whiter.

Expanse 1·2 inches. (*Spec. ex Campi-ya-Simba, Ukamba, January 1899; Dr. J. W. Ansorge; Mus. Rothschild.*)

“DRY-SEASON” FORM OF MALE.—Ground-colour of both wings white; an orange-coloured apical patch on the primaries, narrowly edged with brownish-black on the costa, apex and hind margin to as far as the first median nervule. Secondaries with small brownish nervular spots on the hind margin.

Underside.—Central area of the primaries white, the apical area pale yellow, with a transverse band of orange. Secondaries entirely white, with a streak of orange along the costal margin and a minute spot of the same colour indicated at the end of the cell.

Expanse 1·2 inches. (*Spec. ex Bunda Maria, Somali Land, April 1884; Colonel Yerbury; Mus. Brit.*)

“DRY-SEASON” FORM OF FEMALE.—Very similar to *T. दौर* (fig. 11) in general aspect. On the inner margin a broad dusky line; the hind-marginal border of brownish-black slightly broader. Secondaries with a distinct dusky line crossing the discal area from the sub-median nervule and gradually becoming wider to as far as the first radial nervule.

Underside.—Central area of the primaries white, extending to the posterior angle;

the apical area orange, relieved by a narrow line of brownish spots; the apex and hind margin sandy-buff; a dusky line strongly indicated along the inner margin. Secondaries entirely sandy-buff, the nervular spots brownish as well as the discal line observed on the upper surface, and showing a spot at the end of the costal nervure; the orange costal streak and discoidal spot well pronounced.

Expanse 1.2 inches. (*Spec. ex Somali Land; J. G. Thrupp; Mus. Brit. Type of T. jamesi, Butler.*)

HABITAT.—Throughout Somali Land and the Arusa Galla Country. East Africa from Mombasa and Lamu inland into Equatorial Africa.

SOMALI LAND.—Bunda Maria, April 1884 (*Col. Verbury and J. G. Thrupp; Mus. Brit.*). Upper Shebeli River, September and October (*Dr. Donaldson Smith; Mus. Rothschild*). Sheik Husein, October (*Dr. Donaldson Smith; E. M. Sharpe, P. Z. S. 1896, p. 535*). Arusa Galla Country, September to November (*F. Gillett; Mus. Brit.*).

EAST AFRICA.—Lamu (*Slingsby Godfrey; E. M. Sharpe Coll.*). Melindi, January (*Mus. Rothschild*). Mombasa (*J. D. McCay; Mus. Brit.*). Coast—Teita, December; Gulu-Gulu—Kibwezi, November and December; Witu, May; Rabai Hills, July (*F. J. Jackson Coll.*). Sabaki Valley; Barra, near Merifano; S. W. Corner of Lake Baringo, Kikuyu (*Dr. J. W. Gregory; Mus. Brit.; Butler, P. Z. S. 1894, p. 577*). Mgana, August; Taru, December (*C. S. Betton; Mus. Brit.*). Karamoja (*Capt. Diver; E. M. Sharpe Coll.*). Taru, October; Samburu, Mareh; Ukamba, January (*Dr. J. W. Anson; Mus. Rothschild*). Jombene Range, north-east of Mount Kenya (*W. A. Chanler; Holland, P. U. S. Nat. Mus. p. 762*).

This species is a close ally of *T. दौरα*, but may, in my opinion, be separated by the characters given above. Dr. Donaldson Smith met with it on the Upper Shebeli in "wet country" at 4000 to 5000 feet elevation, and it is found in Eastern Africa from Somali Land to the Arusa Galla Country, thence into the interior of British East Africa from the Equatorial districts to those of the coast region.

I have followed Dr. Butler in his definitions of the "dry," "wet," and "intermediate" seasonal forms, but I cannot say that I entirely agree with the distinctive characters of these different phases. At present, however, our knowledge of the species of *Teracolus* is too incomplete to enable any one to form a definite judgment as regards the seasonal peculiarities of any one species.

With regard to the phases of this species, Dr. Butler's opinion is as follows: "*T. jacksoni* is the wet-season form, *T. thruppi* the intermediate form, and *T. henglini* (= *T. jamesi* ♂) the dry-season form."

EXPLANATION OF THE FIGURES OF *T. henglini*.

Plate 38, fig. 1. ♂ Rabai Hills, July 1889 (*F. J. J.; Jackson Coll.*).

„ 1a. Underside of fig. 1.

- Plate 38, fig. 1b. ♀ Witu, May 1891 (*F. J. J. ; Jackson Coll.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♀ Karamoja (*Capt. Diver ; E. M. Sharpe Coll.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♂ Somali Land (*J. G. Thrupp ; Mus. Brit. ; type of T. thruppi*).
 „ 1g. ♀ Somali Land (*J. G. Thrupp ; Mus. Brit. ; type of T. thruppi*).
 „ 1h. ♀ Campi-ya-Simba, Ukamba, January 1899 (*Dr. J. W. Ansorge ; Mus. Rothschild*).
 „ 1i. ♂ Bunda Maria, Somali Land, April 1884 (*Col. Yerbury ; Mus. Brit.*).
 „ 1j. Underside of fig. 1i.
 „ 1k. ♀ Somali Land (*J. G. Thrupp ; Mus. Brit. ; type of T. jamesi*).
 „ 1l. Underside of fig. 1k.

TERACOLUS EVAGORE (Klug).

(Plate 39, figs. 1, 1a-1h.)

Pontia evagore, Klug, Symb. Phys. Ins. plate viii. figs. 5, 6 (1829).*Anthocharis evagore*, Boisd. Sp. Gén. I. p. 579 (1836).*Callosune evagore*, Kirby, Syn. Cat. Diurn. Lepid. p. 503 (1871).*Teracolus yerburyi*, Swinhoe, P. Z. S. 1884, p. 441, pl. xxxix. f. 12 ; Butler, P. Z. S. 1884, p. 419 ;
id. P. Z. S. 1896, p. 246, pl. x. f. 14 ; Guy Marshall, P. Z. S. 1897, p. 33.*Teracolus sareus*, Swinhoe, P. Z. S. 1884, p. 441, pl. xl. figs. 1, 2 ; Butler, P. Z. S. 1884, p. 491.*Teracolus swinhoei*, Butler, P. Z. S. 1884, p. 491.*Teracolus evagore*, Holland, Proc. U.S. Mus. Hist. xviii. p. 762 (1895) ; Guy Marshall, P. Z. S. 1897, p. 34 ; Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 459 (1897) ; Aurivillius, Rhop. Æthiopica, p. 435 (1898).

Allied to *T. दौरa* and *T. henglini*, but is at once distinguished by the nearly obsolete black line along the inner margin of the primaries, this being represented only by a distinct black spot near the posterior angle.

MALE.—Central area of the primaries creamy-white, the apical area brownish-black, relieved by five spots of orange-red varying in size ; the basal area dusted with grey, this colour faintly indicated on the inner margin and along the costal margin ; a distinct black spot situated near the posterior angle above the sub-median nervure, and connected with the hind-margin by a thin line of black. Secondaries creamy-white, with a large black spot near the apical area, the three median nervules terminating in small spots on the hind margin ; above these spots a distinct grey shading, separated by a line of white ; the base grey, with a black line extending along the costal margin.

Underside.—Very similar to that of *T. henglini*, the usual black inner marginal line only represented by a distinct black spot. Secondaries with the green shading on the hind margin less strongly marked, extending along the sub-median nervure, and suffusing the whole of the basal area.

Expanse 1·3 inches. (*Spec. ex Shaik Othman, Aden, February 1895, Capt. Nurse; E. M. Sharpe Coll.*)

FEMALE.—Central area of the primaries creamy-white, the dark apical area much more reduced than in the male, the orange spots somewhat yellower in colour, the internal black line almost obsolete and replaced by a sulphur-yellow line, the black posterior spot larger than in the male, and showing a slight connection with the hind-margin, the faintest of grey speckling visible along the inner margin. Secondaries creamy-white, the black apical and nervular spots much smaller on the hind-margin; the grey shading near the discal area also fainter than in the male.

Underside.—Similar to that of the male, the ground colour of both wings somewhat yellower, the green shading being almost absent.

Expanse 1·3 inches. (*Spec. ex Aden, 1894; Mus. Rothschild.*)

The “intermediate” form of the male has the ground colour of both wings entirely sulphur-yellow; the orange-red spots on the primaries larger; the grey shading along the inner margin rather more strongly indicated. The underside does not differ from that of the “wet-season” male described above.

Expanse 1·5 inches. (*Spec. ex Haithalhim, April 1884; Col. Yerbury; Mus. Brit. Type of T. swinhoei, Butler.*)

“DRY-SEASON” FORM OF MALE.—Primaries white, relieved by a brilliant orange-yellow patch on the apical area, the costal- and hind-margins narrowly edged with black to as far as the first median nervule. Secondaries entirely white, the nervules terminating in minute brownish spots on the hind margin.

Underside.—Central area of the primaries white, the apical area sandy-buff crossed by a band of deep orange-red. Secondaries ivory-white, the usual orange costal streak and discoidal spot visible.

Expanse 1·2 inches. (*Spec. ex Aden, 1894; Mus. Rothschild.*)

“DRY-SEASON” FORM OF FEMALE.—Central area white, the apical area orange-yellow, crossed by a thin line of dusky brown; the apex and hind margin, to as far as the first median nervule, brownish-black. Secondaries white, the nervules terminating in brownish spots on the hind margin.

Underside.—Ground-colour white, the apical area sandy-buff with a distinct band of orange-red; an almost obsolete spot near the posterior angle. Secondaries sandy-buff, with the usual orange costal streak and disco-cellular spot; a dusky spot at the end of the costal nervure, as well as a dusky line across the median nervules, indicating a broken discal line, the nervules terminating in minute black dots on the hind-margin.

Expanse 1·2 inches. (*Spec. ex Lahaj, Aden; December 1894, Col. Yerbury; Mus. Brit. Type of T. sazeus, Swinhoe ♀.*)

HABITAT.—S. Arabia. Equatorial Africa to Nigeria.

ARABIA.—Aden, February, March, and April (*Col. Yerbury; Mus. Brit.; Capt. Nurse; Butler, P. Z. S. 1896, pp. 253-4*). Huswah, March, May, June, and September (*Col. Yerbury; Mus. Brit.*). Shaik Othman, February, March, and April (*Col. Yerbury; Mus. Brit.*), May (*Mus. Rothschild*). Haithalhim, March, April, and December (*Col. Yerbury; Mus. Brit.*); March and December (*Col. Yerbury; Mus. Rothschild*). Lahej, February, May, and December (*Col. Yerbury; Mus. Brit. et Mus. Rothschild*).

EQUATORIAL AFRICA.—Iombene Range, north-east of Mount Kenya (*W. A. Chanler; Holland, Proc. U.S. Nat. Mus. xviii. p. 762, 1895*).

WEST AFRICA.—Ilo, River Niger, January and February 1899 (*Dr. Cathbert Christy; E. M. Sharpe, Entomologist, vol. xxxv. p. 103, 1902*).

The "wet-season" form, *T. yerburyi*, is very distinct from the corresponding phase of *T. दौरا* and *T. heuglini*, as it lacks the black line along the inner margin, this characteristic mark being replaced by a blackish spot near the posterior angle. I am still doubtful about the "dry-season" form (true *T. evagore*). Dr. Holland has recorded a specimen from Mount Kenya in Equatorial Africa as *T. evagore*. I have not yet seen an example from this part of Africa, and suspect that the specimen, a male, may turn out to be *T. heuglini*. Some specimens of *Teracolus*, collected by my friend Dr. Christy at Ilo in Upper Nigeria, are, in my opinion, absolutely the same as typical examples of *T. evagore* from Arabia. This, it need hardly be said, will, if true, prove to be a very interesting fact in geographical distribution.

I have united *T. yerburyi* to *T. evagore*, following Dr. Butler; but it should be noted that Mr. Guy Marshall considers that it is distinct and that *T. swinhoei* is a yellow variety. I am inclined to agree with him in this conclusion, but I cannot follow him in the suppression of all the forms which he places under *T. evagore*.

Dr. Butler observes in his latest revision of the genus: "*T. yerburyi* is the wet-season form; *T. swinhoei* may be taken as either a yellow variety or an intermediate type, and *T. evagore* (*T. saxeus*) is the dry-season form. Practically the whole of the forms are dry-season, but they represent the seasonal phases which occur in more variable climates. That *T. evagore* is the dry-season phase of *T. yerburyi* (and consequently *T. heuglini* of *T. thruppi* and *T. noua* of *T. दौरा*) is evident from the fact recorded (*P. Z. S. 1896, p. 247*) that one pupa from a batch of larvæ bred by Capt. Nurse produced *T. evagore* (he calls it *T. noua*, but that is a mere misidentification) and all the others *T. yerburyi*."

Colonel Yerbury has sent me the following observations on *T. yerburyi* and *T. evagore*. Of the former he writes: "Common inland. The larva feeds on a plant, possibly *Caduba indica*, but it has not been identified. They are plumbeous, faintly

spotted with white, the dorsal stripe on each flank orange; below the lateral stripes a black projection spotted with white on each segment. The larvæ are covered with short bristly hairs. The pupa varies in colour from pale lilac to straw colour, with a purple central and yellow lateral stripes. Length of the pupa stage about seven days. The pupæ have a considerable resemblance to those of *Euchloe cardamines*.

“*T. evagore* is very common inland; the larvæ feed on the same plant as *T. yerburyi*. Neither of these orange-tipped species is to be found in Aden proper. Too much stress should not be laid on the fact that Capt. Nurse bred a specimen of *T. evagore* from a caterpillar taken with the larvæ of *T. yerburyi*. The facts of the case are as follows. At Shaik Othman one day Capt. Nurse collected about forty larvæ feeding on a certain species of plant (probably *Caduba indica*). These larvæ were collected from many plants, and from them emerged many specimens of *T. yerburyi* and one specimen of *T. evagore*. The larva of *T. evagore* was not recognised, though it may have been quite distinct from those of *T. yerburyi*; nor is there any evidence to show that the egg from which this larva emerged was not laid by *T. evagore* ♀. *T. evagore* and *T. yerburyi* may be seasonal forms, but at present the fact is not proved.”

EXPLANATION OF THE FIGURES OF *T. evagore*.

- Plate 39, fig. 1. ♂ Shaik Othman, February 1895 (*Capt. C. G. Nurse; E. M. Sharpe Coll.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Aden, 1894 (*Mus. Rothschild*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Haithalhim, April 1884 (*Col. Yerbury; Mus. Brit. Type of T. swinhoei*).
 „ 1e. ♂ Aden, 1894 (*Mus. Rothschild*).
 „ 1f. Underside of fig. 1e.
 „ 1g. ♀ Lahej, December, 1884 (*Col. Yerbury; Mus. Brit. Type of T. sareus*).
 „ 1h. Underside of fig. 1g.

TERACOLUS EMINI, Butler.

(Plate 39, figs. 2, 2a-2g.)

Teracolus emini, Butler, Ann. and Mag. Nat. Hist. (6) vii. p. 47 (1891); *id. l.c.* (6) xx. p. 460 (1897).

Teracolus evagore, (part.), Guy Marshall, P. Z. S. 1897, p. 34.

Teracolus antigone, var. *emini*, Aurivillius, Rhop. Æthiopia, p. 440 (1898).

Distinguished from *T. evagore* by the large orange patch on the primaries and the broad and heavily marked black borders on both wings.

MALE.—Central area white, the costa, apex, and hind-marginal borders brownish-black; a broad line of the same colour along the inner margin, extending a little over the middle of the wing; a thin dusky line connecting this border with a distinct brownish-black spot, which relieves the large orange-yellow patch on the apical area, thus enclosing a white spot near the posterior angle. Secondaries white; the costal and hind-margins broadly bordered with brownish-black, the hind-marginal border relieved by two white spots near the apex; the base dusted with grey.

Underside.—Ground colour of the primaries white, the whole of the apical area orange-yellow, the nervules terminating in black streaks on the hind margin; a dusky band along the inner margin, ending in a distinct dusky spot near the posterior angle. Secondaries entirely white; the nervules streaked with black on the dusky hind-marginal border; a faint transverse band crossing the discal area, becoming somewhat stronger towards the inner margin; a similar line faintly indicated on the primaries; the usual orange costal streak and discoidal spot well pronounced.

Expanse 1·4 inches. (*Spec. ex Kandera; Emin Pasha; Mus. Brit. Type of species.*)

FEMALE.—Ground colour white; the costa, apex, and hind-margin of the primaries brownish-black; the apical area orange-yellow, crossed by a thin dusky line, uniting with the broad brownish-black border along the inner margin, and thus forming a distinct white spot near the posterior angle; the base dusted with brown; a small spot of the same colour visible at the end of the cell. Secondaries with the central area white; a broad brownish-black border on the costal and hind-margins, the latter relieved by a row of white spots more or less in evidence; a dusting of brownish-grey along the sub-median nervure from the base to the hind-margin.

Underside.—The discal area whitish; the apex, hind-margin, and basal area sulphur-yellow; the apical area orange; a brownish line along the inner margin; the discoidal spot and the median nervules brown. Secondaries with the ground colour yellowish-white, somewhat deeper in tint at the base and on the hind margin; the discal line orange, slightly suffusing the upper half of the hind-marginal border; the usual costal streak and discoidal spot distinctly indicated; the nervules terminating in minute brown spots.

Expanse 1·3 inches. (*Spec. ex Atbara River; Mus. Brit.*)

“DRY-SEASON” FORM OF MALE.—Similar to that of the “wet-season” form, the white ground colour of both wings more creamy in appearance, and the white spot on the primaries near the posterior angle suffused with brownish-black; the orange-yellow patch slightly smaller, under certain lights with a lilac shade; the brown markings similar to those of the male (fig. 2); a minute brown spot indicated at the end of the cell. Secondaries not differing from those of the male, excepting that the

white spots on the hind-marginal border are more strongly pronounced ; a grey shading also above the marginal border, crossing the median nervules.

Underside.—The central upper area of the primaries white ; the costa and apex sandy-buff, the orange band very brilliant ; a dusky line along the inner margin terminating in a black spot near the centre of the wing ; the usual minute black dot visible at the end of the cell ; a narrow dusky line traversing the discal area from the costa to the inner margin. Secondaries entirely sandy-buff, rather deeper in colour on the hind-margin and at the base ; a brownish line, more or less connected, crossing the discal area ; the orange spot at the end of the discoidal cell, and relieved by a minute black dot, large and bright in colour, as well as the costal streak.

Expanse 1·4 inches. (*Spec. ex Grahamstown, Cape Colony ; Godman-Salvin Coll. ; Mus. Brit.*)

“ DRY-SEASON ” FORM OF FEMALE.—Central area of the primaries creamy-white ; the apical area and hind-margin brownish-black, relieved with five orange spots, more or less obsolete ; the brown border on the inner margin strongly marked, as well as the discoidal spot ; the upper half of the basal area suffused with sandy-buff. Secondaries similar to those of the female above described (fig. 2b), the broad hind-marginal border much broken up by the row of white spots, which vary in size ; a broad suffusion of sandy-buff over the inner marginal half of the wing.

Underside.—Similar to that of the female (fig. 2c) in spots and markings. The secondaries sandy-buff, thickly dusted with greyish-brown specklings ; a light streak visible between the third median nervule and the first radial nervule.

Expanse 1·3 inches. (*Patr. ign. ; Hewitson Coll. ; Mus. Brit.*)

HABITAT.—From S.E. Africa to Nyasa Land, and thence to Equatorial Africa and the interior of the Abyssinian sub-region.

NORTH-EAST AFRICA.—Atbara River (*Mus. Brit.*).

EQUATORIAL AFRICA.—Kandera (*Emin Pasha ; Mus. Brit.*).

GERMAN EAST AFRICA.—Magwangware, Kipperere, January (*Dr. Ansorge ; Mus. Rothschild*).

BRITISH CENTRAL AFRICA.—Nyasa Land (*Sir H. H. Johnston ; Mus. Brit.*). Lake Nyasa (*Godman-Salvin Coll. ; Mus. Brit.*).

SOUTH-WEST AFRICA.—'Ngami country (*Sir F. D. Lugard ; Mus. Brit.*). Fovira, Unyoro, May (*Dr. Ansorge ; Mus. Rothschild*).

SOUTH-EAST AFRICA.—Delagoa Bay (*Godman-Salvin Coll. ; Mus. Brit. ; et Mus. Rothschild*). Lorenzo Marquez (*C. C. Kenrick ; Mus. Brit.*). Natal (*E. C. Burton ; Mus. Brit.*). Bushman's River, Natal (*I. M. Hutchinson ; Mus. Brit.*) Grahams-town (*Godman Salvin Coll. ; Mus. Brit.*).

This species is certainly very close to the following *T. cione*, and Dr Butler does

not make a very good case for its separation. He observes: "But for the fact that the dry-season form of this species exactly resembles that of the wet-season on the upper surface, I should not have hesitated to regard it as an exaggerated development of the closely allied *T. eione*. The latter, however, appears to be strictly confined to Southern Africa."

After comparing a number of specimens I must also confess that I doubt the distinctness of *T. emini*, and Dr. Butler admits that the species is more than a little doubtful.

EXPLANATION OF THE FIGURES OF *T. emini*.

- Plate 39, fig. 2. ♂ Kandera (*Emin Pasha*; *Mus. Brit. Type of species*).
 „ 2a. Underside of fig. 2.
 „ 2b. ♀ Atbara, River (*Mus. Brit.*).
 „ 2c. Underside of fig. 2b.
 „ 2d. ♂ Grahamstown (*Godman-Salvin Coll.*; *Mus. Brit.*).
 „ 2e. Underside of fig. 2d.
 „ 2f. ♀ *loc. ign.* (*Hewitson Coll.*; *Mus. Brit.*).
 „ 2g. Underside of fig. 2f.

TERACOLUS ANTIGONE (Boisduval).

(Plate 40, figs. 1, 1a-1o.)

- Anthocharis antigone*, Boisduval, Spée, Gén. Lép. i. p. 572 (1836).
Anthocharis phlegetonia, Boisd. l.c. p. 576 (1836).
Anthocharis delphine, Boisd. l.c. p. 577 (1836).
Callosune antigone, Kirby, Syn. Cat. Diurn. Lepid. p. 502 (1871); Westwood in Oates' Matabele Land, App. p. 338 (1881).
Teracolus subfumosus, Butl. P. Z. S. 1876, p. 139, pl. vi. f. 3; *id.* P. Z. S. 1896, p. 838.
Teracolus lycoris, Butl. t.c., 1876, p. 140.
Teracolus flaminia, Butl. t.c., 1876, p. 140, pl. vi. f. 1.
Teracolus lyceus, Butl. t.c., p. 141, pl. vi. f. 2.
Teracolus frigga, Butl. t.c., p. 142, pl. vi. f. 5.
Callosune subfumosus, Kirby, l.c. Suppl. p. 805 (1877).
Callosune flaminia, Kirby, l.c. Suppl. p. 804 (1877).
Callosune lyceus, Kirby, l.c. Suppl. p. 805 (1877).
Callosune frigga, Kirby, l.c. Suppl. p. 804 (1877).
Teracolus minaus, Butl. Ent. Monthly Mag. xviii. p. 229 (1882); E. M. Sharpe, P. Z. S. 1894, p. 349; Butler, P. Z. S. 1894, p. 577; E. M. Sharpe, P. Z. S. 1896, p. 536.
Teracolus coniger, Butl. l.c. p. 229 (1882).
Teracolus antigone, Trimen, S. Afr. Butt. iii. p. 148 (1889); *id.* P. Z. S. 1891, p. 99; Butl. Ann. and Mag. Nat. Hist. (6) xx. p. 461 (1897); Aurivillius, Rhop. Æthiopica, p. 440 (1898).
Teracolus phlegetonia, Trimen, l.c. iii. p. 151 (1889); *id.* P. Z. S. 1891, p. 99; Holland, Proc. U.S. Nat. Mus. xviii. p. 762 (1895); *id.* l.c. p. 244 (1895).
Teracolus ecagore, (part.) Guy Marshall, P. Z. S. 1897, p. 34.

This species may be distinguished from *T. emini* and *T. eione* by the sulphur-yellow colour at the base of the underside of the primaries. On the upper surface the black inner marginal line of the primaries is narrower, and is united to the twin spots on the orange apical patch. In the "intermediate" and "dry" seasonal forms, this black-marginal line is more or less obsolete.

MALE.—Central area of the primaries white; the orange apical patch rather small and very much toothed; this patch relieved on the hind-marginal side by two black spots, situated on the third median and first radial nervules; the costa and hind margin black, as well as the line on the inner margin, which extends from the base to a little beyond the centre of the wing. Secondaries white, the base and costal margin brownish-black, the nervules terminating on the hind margin in large blackish spots, divided by white streaks.

Underside.—Central area of the primaries white; the base sulphur-yellow; the apical area orange; the apex and hind margin greenish-yellow; the nervules tipped with black; a minute black spot visible at the end of the cell; the inner marginal line fainter. Secondaries entirely creamy-white; the nervules terminating on the hind margin in black spots; the usual orange costal streak and discoidal spot clearly indicated.

Expanse 1·7 inches. (*Spec. ex. Cape of Good Hope; Druce Coll.; Godman-Salvin Coll.; Mus. Brit.*; Form of *T. phlegetonia*.)

FEMALE.—Upper half of wing creamy-white; the base and inner margin brownish-black; the orange apical area broader and divided by a distinct line of brownish-black, which joins the dark colour on the inner margin; the costa, apex and hind margin brownish-black, with a large white spot visible near the posterior angle, the usual black spot visible at the end of the cell. Secondaries with the central area creamy-white, the broad brownish-black hind-marginal border relieved by creamy-white spots varying in size; the base and costal margin brownish-black.

Underside.—The apical area orange, traversed by a thin dusky line; the apex and hind margin sandy-buff; a white line from the costa to the posterior angle covering the central area of the wing; the extreme base sulphur-yellow; a greyish-black line indicated along the inner margin. Secondaries entirely sandy-buff, somewhat darker on the basal area; the transverse band on the discal area indicated by a reddish spot on the costal margin, and a second and larger spot over the median nervules; on the hind margin the nervules terminating in minute black dots.

Expanse 1·6 inches. (*Spec. ex. Natal; Mus. Rothschild*; Form of *T. phlegetonia*.)

A second form of the "wet-season" phase *T. minans* = *T. coniger* has all the black spots and markings on both wings less strongly marked; the orange apical patch also smaller.

The underside does not differ from that of the male above described, with the exception that the black nervular spots on the hind margin of both wings are obsolete.

Expanse 1 inch. (*Spec. ex. Accra; Sir Gilbert Carter; Mus. Brit.* Type of *T. minans*.)

The female has the orange apical patch on the primaries much smaller, the brownish-black marginal border being very broad; the inner-marginal line much reduced and faintly indicated by a grey dusting. The secondaries white, the hind-marginal border narrower.

Underside.—The ground-colour of the secondaries pale yellow, the same colour apparent on the apex and hind margin of the primaries; otherwise the spots and markings agree with those of the female above described Fig. 1c.

Expanse 1.6 inches. (*Spec. ex. Accra; Sir Gilbert Carter; Mus. Brit.* Type of *T. minans*.)

“INTERMEDIATE” FORM OF MALE.—Ground-colour creamy-white; the apical area orange; the costa, apex, and hind margin narrowly edged with black; this orange apical patch relieved by two black spots situated on the second and third median nervules; the inner-marginal line faintly indicated by a dusting of grey. Secondaries creamy-white, thickly dusted with grey at the base; a black spot visible at the end of the costal nervure; the nervules terminating in black spots on the hind margin.

Underside.—Central area of the primaries white, with a minute dusky spot visible near the posterior angle; the apical area orange-red shading into sandy-yellow towards the apex. Secondaries entirely sandy-pink, the basal area with greyish dustings, the usual discal transverse line indicated by two reddish spots, one at the end of the costal nervure, the second between the second and third median nervules.

Expanse 1.5 inches. (*Spec. ex. Natal; Mus. Rothschild.* Form of *T. friga*.)

“INTERMEDIATE” FORM OF FEMALE.—Ground-colour of the primaries white, the apical area dusky brown relieved by five hastate streaks of pale yellowish-white; the darker colour being more intensified on the inner edge of the apical patch, and united to the usual dusky marks along the inner margin; the costal margin faintly dusted with grey. Secondaries white; the costal margin dusky brown, this colour visible in small nervular spots on the hind margin; a faint discal line of grey extending over the median nervules; the basal area thickly dusted with grey.

Underside.—The base, costal margin, and apical area pale yellow, the latter with a narrow transverse band of reddish-brown, being united to the grey band along the inner margin; the centre of the wing, and the posterior angle white.

Secondaries pale sandy-yellow, with faint grey nervular spots on the hind margin, a greyish line visible over the discal area.

Expanse 1.1 inches. (*Spec. ex Molo River* ; 25 March, 1898 ; *Dr. Ansorge* ; *Mus. Rothschild*. Form of *T. friga*.)

A second form of the female has the ground-colour of both wings pale sulphur-yellow, the brown apical patch relieved by two lines of orange-yellow ; the basal area and inner margin dusted with greenish-grey and terminating in a black spot near the posterior angle ; the usual minute black dot visible at the end of the cell.

Secondaries rather more yellow, with the exception of the ground-colour. The spots and markings, although larger and more strongly marked, are situated as in the female above described.

Underside.—Agrees with the female (fig. 1g) in the spots and markings ; the apical area of the primaries and the secondaries being of rather a deeper shade of yellow, and covered by thin wavy lines of brown.

Expanse 1.1 inches. (*Spec. ex Eldoma Ravine* ; 22 March, 1898 ; *Dr. Ansorge* ; *Mus. Rothschild*. Form of *T. friga*.)

“ DRY-SEASON ” FORM OF MALE.—Central area of the primaries creamy-white ; the apical area orange-red, narrowly edged on the costa, apex, and hind margin with brown as far as the first median nervule ; between the second and third median nervules a distinct brown spot situated on the inner edge of the orange colour ; the base thickly dusted with grey, extending along the inner margin but much more faintly indicated ; the cilia reddish-buff. Secondaries entirely creamy-white ; the basal area and costal margin thickly suffused with grey ; the nervules terminating on the hind margin in brownish spots ; the cilia reddish-buff.

Underside.—Ground-colour white ; the costa and the apical area sandy-red, the latter having a distinct band of orange-red. Secondaries entirely sandy-rufous, suffused with a dusting of brownish-grey ; minute nervular dots visible on the hind margin.

Expanse 1.3 inches. (*Spec. ex South Africa* ; *Mansel-Weale* ; *Godman-Salvin Coll.* ; *Mus. Brit.* Typical *T. delphine*.)

“ DRY-SEASON ” FORM OF FEMALE.—Ground-colour creamy-white ; the apical area orange yellow, the inner side of this patch being edged with a rather broad band of brown, somewhat broken towards the costal margin ; the apex and hind margin brown as far as the first median nervule ; the base black, with faint grey dustings ; an almost obsolete grey spot situated near the posterior angle ; the usual black dot visible at the end of the cell. Secondaries creamy-white ; the brown nervular spots on the hind margin varying much in size ; the transverse line on the discal area represented by a brown spot at the end of the costal nervule, and two similar spots between the third median and first radial nervules ; the basal area black with dustings of grey.

Underside.—Central area of the primaries white, the apical area sandy-buff relieved by a transverse band of dusky brown; a faint spot of reddish-brown visible near the posterior angle; the base pale yellow, and the black discoidal spot very distinct. Secondaries entirely warm sandy-buff covered with dustings of dusky brown; a distinct line of the same colour extending from the base, through the cell to about the centre of the discal area; two dusky-brown spots situated at the end of the costal nervure.

Expanse 1·4 inches. (*Spec. ex. Grahamstown, Cape Colony; Godman-Salvin Coll.; Mus. Brit.* Form of, *T. delphine*.)

A second form of the *T. delphine* phase which I have figured and which is the type of *T. lyons*, hardly differs from that of the male above described; the orange apical patch on the primaries may be somewhat brighter and in some lights a lilac sheen can be observed. The basal area of both wings has the black less strongly pronounced. The underside of the secondaries is much pinker as regards the ground-colour and the dusky-brown streak is not so strongly marked.

Expanse 1·2 inches. (*Spec. ex. South Africa; E. C. Buxton; Mus. Brit.*)

The female of this second "dry-season" form has the ground-colour of the primaries pale sulphur-yellow, the orange colour being replaced by five hastate spots of tawny-yellow, the inner line of brown narrower and not broken as in fig. 1L; the dusky grey line along the inner margin also a little more strongly marked. Secondaries, with the exception of the sulphur-yellow ground-colour, the spots and markings are similar to those of the female (fig. 1L). The underside hardly differs from the female above described (fig. 1m).

Expanse 1·2 inches. (*Spec. ex. South Africa; E. C. Buxton; Mus. Brit.* Form of *T. flaminia* [*T. subfumosus*].)

HABITAT.—Tropical Africa generally. East Africa from British Caffraria to Abyssinia. S. W. Africa. W. Africa; Senegambia to the Niger.

WEST AFRICA.—River Gambia (*Crowley Coll. Mus. Brit.*). Bathurst (*Mus. Rothschild*). Kumasi, Ashanti (*Captain Giffard; Mus. Rothschild*). Accra (*Sir Gilbert Carter; Mus. Brit.*). Gambaga, Gold Coast Hinterland, June–November, 1898 (*Colonel Northcott; Captain Giffard; Mus. Rothschild*). Togoland (*Mus. Rothschild*). Asaba River, Niger (*Dr. W. H. Crosse; Mus. Brit.*).

NORTH-EAST AFRICA.—Atbara River (Cf. Trimen, *South African Butterflies*, III., p. 151, 1889). Bogos Land (*Coll. Oberthur*); Shoa (*Oberthur; l.c.* p. 154). Somali Land, Shaik Husein, September (*Dr. Donaldson Smith*).

EQUATORIAL AFRICA.—Wadelai, March (*Emin Pasha; Mus. Brit.*). Karunga, Kyanka, March; Podia, April; Fajao Unyoro, December (*Dr. Ausorge; Mus.*

Rothschild). Kampala, February (*G. F. Scott-Elliot* ; *Mus. Brit.*). Eldoma Ravine, March ; Mota River, March (*Dr. Ansorge* ; *Mus. Rothschild*).

BRITISH EAST AFRICA.—Kibaeni, Ukamba, April (*Dr. Ansorge* ; *Mus. Rothschild*), March from Maungu to Marogoyakanga 3100 to 2400 feet, December 30, 1891 ; March from Voi River to Ndi, 1925 to 2300 feet, January 8, 1892. March from Mreru in Ndi, 2300 feet, to Tsavo, 1650 feet, January 9, 1892 (*Captain J. W. Pringle, R.E.*, Cf. *E. M. Sharpe, P. Z. S.* 1894, p. 349). Njemps ; (*Dr. Gregory* ; *Butler, P. Z. S.* 1894, p. 577). Usagara (*Crowley* ; *Mus. Brit.*).

BRITISH CENTRAL AFRICA.—Mpeta, Loangwa River, affluent of the Zambesi, November and December, (*Coryndon* ; *Mus. Rothschild*). Tete (*Hopffer* ; *Trimen, t.c.* p. 154). Zambesi (*Mus. Brit.*).

SOUTH-EAST AFRICA.—Salisbury, Rhodesia, May and June (*G. A. K. Marshall* ; *Mus. Brit.*). Matabele Land, Tawani River (*F. C. Selous*). Tati (*J. L. Fry* ; *Trimen, t.c.* p. 154). Murehison Range (*C. R. Jones* ; *Mus. Brit.*). Lydenburg district (*T. Ayres*). Marico and Limpopo Rivers (*F. C. Selous* ; *Trimen, t.c.* p. 153). Swazi Land (*E. C. Buxton* ; *Trimen, t.c.* p. 151). Delagoa Bay, Lorenzo Marques (*Mrs. Monteiro* ; *Trimen, t.c.* p. 151). Natal (*Mus. Rothschild*). Greytown, Valley of the Tugela, Mooi River (*J. H. Bowker*). Verulam, Durban, Estcourt, Bushman's River (*J. M. Hutchinson*). Weenen (*Mus. Rothschild*). Tugela River, 2500 feet, October and November (*G. A. K. Marshall* ; *Mus. Brit.*). Bedford (*J. P. Mansel-Weale*). King William's Town (*W. S. M. D'Urban*). Bashee River (*J. H. Bowker* ; *Trimen, t.c.* pp. 151, 153). Fish River (*Mrs. Barber*). Uitenhage (*S. D. Bairstow* and *J. M. Bowker* ; *Trimen, t.c.* pp. 151, 153). Grahamstown (*Godman-Salvin Coll.* ; *Mus. Brit.*).

SOUTH-WEST AFRICA.—Benguela, Caconda, May ; Ketengue, July (*Penrice* ; *Mus. Rothschild*).

Damara Land (*C. J. Andersson* ; *F. A. Bell* ; *Trimen, t.c.* p. 154). Ehanda, Central Damara Land, September (*Eriksson* ; Cf. *Trimen, P. Z. S.* 1891, p. 99).

Teracolus antigone is closely allied to *T. emini* and *T. cione*, its chief characteristic being the pale sulphur-yellow suffusion at the base of the underside of the primaries.

The species appears to have a wide range extending over the greater part of Tropical Africa as will be seen by the list of localities given above. It will probably be found to occur in the Soudan from Senegambia to Abyssinia, and the evidence proves that it extends throughout Eastern Africa to the eastern districts of the Cape Colony. It is found in South Western Africa, but would appear to be absent throughout the forest region of the Congo and Gaboon districts.

Of the "wet"-season forms *T. phlegetonia* is the most heavily marked, *T. minaus* and *T. coniger* having the black markings much reduced : in both sexes the characters

seem to be pretty constant. *T. friga* is the intermediate form, the females varying considerably, some with the orange apical band very pronounced, some with small orange spots, and others with no orange colour visible on the brownish-black apical area; again, the ground-colour in some varies from white to sulphur-yellow.

Of the "dry"-season forms there is a large series in the British Museum which includes *T. delphine*, *T. lycoris*, *T. subfumosus*, *T. flaminia*, and *T. lyæus*.

The males vary somewhat in size, some being large and others dwarfed. The markings seem fairly constant with the exception that some specimens show a faint dusting of grey along the inner margin of the primaries.

The variations in the females are numerous, the orange apical band on the primaries being present in both the white and sulphur-yellow ground-coloured forms; again, specimens with the same ground-colour have yellow hastate spots in place of the orange markings, whilst others have the apical spots almost obsolete.

Thanks to the kindness of Professor Poulton, I was recently permitted to examine the typical specimens of *T. pseudetrida*, in the Oxford Museum. Dr. Dixey brought them to London and after comparison with Dr. Butler of the series in the British Museum, we came to the conclusion that they were females of *T. subfumosus*, the "dry"-season form of *T. antigone*; they consequently have nothing to do with *T. pallene* (Cf. E. M. Bowdler Sharpe, Monograph of the Genus *Teracolus*, p. 119), to which species Westwood's misleading description led Dr. Butler to refer them.

Dr. Butler writes: "When I described the above forms as distinct we had no examples of the very distinct wet-season phases from the south, nor was I aware of the variability or the seasonal distinctions which occur in *Teracolus*; therefore when I found half a dozen or more examples which seemed to correspond in the possession of certain characters in both sexes, I naturally supposed that I had different species before me. The Godman-Salvin collection, which was tolerably rich in examples of this species, has enriched our series, adding eight typical examples of *T. phlegetonia* (wet-season) from the Cape of Good Hope, also five examples of the variety *T. minans* = *T. coniger* from the Cape, as well as seven examples of the dry-season form *T. delphine*. With our present series I am satisfied that the above synonyms represent one tolerably variable species. I cannot however, believe that *T. antigone*, the wet-season form of which always has both the base and apex of the primaries bright lemon-yellow on the under surface, and which has a much narrower internal black stripe in all its forms, is identical with *T. eione* or *T. emini*. Typical *T. antigone* has no internal stripe. Of the named forms, *T. phlegetonia* and *T. minans* are wet-season phases, *T. friga* is intermediate, and the remainder are variations of the dry-season form."

The name of this species has been united with a number of others to *T. evagore*, by Mr. Guy Marshall (Cf. P. Z. S. 1897, p. 36). I do not agree in all his identifications, but quote the following note he has written upon the subject.

"This widespread little species is certainly the most variable of all the *Teracoli*, as is well shown by the above lengthy list of synonyms.

"In May 1893 I found the dry-season form of this species very plentiful in the Northern Transvaal, and they there exhibited much greater variation than in either Natal or Mashonaland, more especially the females, which presented a wonderful variety of coloration. Most of these forms have been raised to specific rank by Dr. Butler, but he has based his species chiefly on the relative development of the variable seasonal black markings in the male. We thus get a graduated series from the lightly marked *T. subfumosus*, through *T. lycoris*, *T. flaminia*, *T. friga*, *T. lyceus*, *T. ramaquebana*, to *T. galathinus*, in which the upperside markings approach to those of the wet-season form of the species, represented by *T. phlegetonia* (Boisd.). All these forms exhibit the tinted and irrorated underside colouring, which in South Africa, at all events, is always characteristic of the dry-season form. I have, however, seen very few specimens of this type from Central Africa, and these appear to have been captured in the dry belt of country referred to by Mr. Scott Elliot in his interesting book on that region. It is therefore possible that in the more humid and forest-clad areas the dry-season form may be represented by *T. antigone* (Boisd.), which differs from South African specimens in having a pure white underside, and here, too, we can find every gradation of colouring linking it to *T. phlegetonia*. But I can find no sufficient reason for separating *T. noua* (Luc.) from *T. antigone*, the only difference being that the black borders are reduced and the variable inner-marginal bar and the black spot on the inner edge of the apical patch, both of which are evanescent in *T. antigone*, have quite disappeared in *T. noua*.

"The latter, again, seems to me identical with *T. jamesi*, Butl., *T. heuglini* (Feld.), and *T. evagore* (Klug.). In the arid climate of Arabia *T. evagore* appears to be the normal wet-season form, the dry-season form being probably *T. savens*, Swinh., which only differs in having a pink underside.

"Of the two specimens of *T. gelasinus* in the British Museum, one has the underside pure white while the other is sparsely irrorated with grey; on the upperside of forewings they have no inner-marginal bar, but the spot on the inner edge of the patch is distinct. They thus form an interesting link between *T. antigone* and the southern dry form, being also intermediate in locality, as they came from Angola. With regard to some of the other variations which have been described as species; *T. minans* is a variable form ranging across the Continent in Central Africa; it is white below, and the upperside markings show practically every gradation from *T. evagore* to

T. phlegetonia. *T. comptus*, from Kilimanjaro, has the transverse bar narrow and sometimes very faint, the spot in apical patch ill-defined, and the marginal spots in hind wing separate but distinct. *T. coniger*, from the West Coast (Accra), is very similar, but has the transverse bar a little stronger and the nervular spots in hind wing larger and triangular in shape. *T. glycera* is founded on a single male of *T. minans* (labelled Africa?), which, while retaining the inner-marginal bar, has lost the black spot in patch; the border in hind wings is broad and somewhat diffuse inwardly. *T. bifasciata* I cannot distinguish from *T. minans*, and, as, I have noted above, the male of Col. Swinhoe's *T. xanthus* and the female of *T. odysseus* are clearly attributable to this form. *T. interruptus*, from Angola and S. W. Africa, much resembles *T. comptus*, but has the spot in apical patch better defined and the nervular spots in the hind wing are united into a broad border. *T. lucullus*, from Angola and Victoria Nyanza, are only lightly marked specimens of *T. phlegetonia*, and *T. emini* is founded on a single male from Central Africa, in which the black borders are a little deeper than in typical *T. phlegetonia*."

Dr. Trimen makes the following remarks under *T. phlegetonia*. (Cf. Trimen, South African Butterflies, III., p. 153). "This is one of the most striking of the smaller species of *Teracolus*, the relatively large size of the orange patch and the depth and extent of the black markings rendering it very conspicuous. I found it very seldom during my stay in Natal, but abundantly in the scrub bush at Uitenhage, Cape Colony.

"It is an active insect, but not swift, and flies close to the ground, appearing in the height of summer (January to March). Near Grahamstown I also met with the species, and on February 12, 1870, captured the united sexes. In this pair neither sex had the black markings at their highest development, and the well-marked apical orange of the female partly penetrated the upper part of its broad inner blackish border. In another pair, taken *in copulâ* by Colonel Bowker near the Upper Tugela on April 2, 1880, the male has heavy dark markings, but the female is scarcely more heavily marked than the darkest females of *T. antigone*, and has the apical orange superiorly almost as in the male, the usual dark inner border being reduced to a series of dusky nervular marks well within the orange. A very fine female, sent from Weenen Country in Natal by Mr. J. M. Hutchinson, considerably surpasses that here noticed as regards the width of the apical orange and the faintness of the traces of the inner dark border of the orange, but presents, on the contrary, all the great black markings in their highest development on both wings."

EXPLANATION OF THE FIGURES OF *T. antigone*.

- Plate 40, fig. 1. ♂ Cape of Good Hope (*Godman-Salvin Coll., Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Natal (*Mus. Rothschild*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Accra (*Sir Gilbert Carter; Mus. Brit.*).
 „ 1e. ♀ Accra (*Sir Gilbert Carter; Mus. Brit.*).
 „ 1f. ♂ Natal (*Mus. Rothschild*).
 „ 1g. ♀ Molo River, March, 1898 (*Dr. Ansorge; Mus. Rothschild*).
 „ 1h. ♀ Eldoma Ravine, March, 1898 (*Dr. Ansorge; Mus. Rothschild*).
 „ 1i. Underside of fig. 1h.
 „ 1j. ♂ South Africa (*Mansel-Weale; Godman-Salvin Coll.; Mus. Brit.*).
 „ 1k. Underside of fig. 1j.
 „ 1l. ♀ Grahamstown, Cape Colony (*Godman-Salvin Coll.; Mus. Brit.*).
 „ 1m. Underside of fig. 1l.
 „ 1n. ♂ Underside. South Africa (*E. C. Burton; Mus. Brit.*).
 „ 1o. ♀ Underside. South Africa (*E. C. Burton; Mus. Brit.*).

TERACOLUS EIONE, Boisduval.

(Plate 41, figs. 1, 1a-1m.)

Anthocharis eione, Boisd. Sp. Gén. Léop. i. p. 578 (1836).*Callosune eione*, Kirby, Syn. Cat. Diurn. Lepid. p. 503 (1871); Westwood in Oates' Matabele Land, App. p. 340 (1881).*Teracolus galathinus*, Butl. P. Z. S. 1876, p. 142.*Callosune galathinus*, Kirby, l.c. Suppl. p. 804 (1877).*Teracolus eione*, Butler, P. Z. S. 1888, p. 74; *id.* Ann. and Mag. Nat. Hist. (6) xx. p. 460 (1897).*Teracolus evagore*, (part) Guy Marshall, P. Z. S. 1897, p. 34.*Teracolus antigone*, (part) Aurivillius, Rhop. Æthiopica, p. 440 (1898).

Closely allied to *T. emini*, but distinguished from that species by having the black hind-marginal border on the secondaries much less heavily marked. A minute black dot is also visible at the end of the discoidal cell on the primaries, and the mauve shading on the orange colour is perhaps not so strongly marked as in the former species.

MALE.—The central area of the primaries whitish; the apical area orange, the costa, apex, and hind margin black, this colour being also strongly indicated along the inner margin and united to the orange patch by a thin dusky line where it terminates in a black spot, somewhat smaller than in *T. emini*, thus enclosing a distinct white spot near the posterior angle. Secondaries creamy-white, the base and costal margin brownish-black; the nervules terminating on the hind margin in large blackish spots, and disconnected by streaks of white, with a slight dusting of grey visible above the median nervules.

Underside.—Ground-colour of the primaries white; the apical area sandy-yellow, relieved by a strong orange band, outlined on the upper edge by a thin dusky line which unites with the broad blackish border along the inner margin. Secondaries creamy-white, somewhat greener on the hind margin, the nervules terminating in minute black dots; the discal line indicated by a brownish spot at the end of the costal nervure, a second spot being situated between the second and third median nervules; the orange costal streak and discoidal spot strongly pronounced.

Expanse 1·4 inches. (*Spec. ex Tugela River, Natal, 2500 feet, November 13, 1896; G. A. K. Marshall; Mus. Brit.*)

FEMALE.—The creamy-white ground-colour on the primaries restricted to a narrow band, which crosses the discal area from the inner margin to the costa, this colour extending thence over the upper half of the cell to the base; the inner margin heavily marked with brownish-black to within a short distance of the posterior angle, and extending into the discoidal cell; the apical area orange, divided by a transverse band of dusky-brown, from the costa to the brown colour on the inner margin; the costa, apex, and hind margin brownish-black; a distinct black spot visible at the end of the cell. Secondaries with the central area creamy-white; the base, costa, and hind margin heavily marked with brownish-black, the latter relieved by small white streaks, two near the apex being large and distinct; a dusting of greyish-yellow visible along the area of the inner margin.

Underside.—The white band on the primaries suffused with yellow, as well as the apex and hind margin, the orange patch very bright, traversed by a faint dusky line; the black on the inner margin less in evidence than on the upper-side and dusted with grey; the small black spot at the end of the cell well marked. Secondaries with the ground-colour yellowish-buff, a transverse line of rufous crossing the discal area; the black discoidal spot enclosed with orange and the usual streak visible along the costal margin.

Expanse, 1·4 inches. (*Spec. ex Tugela River, Natal, 2500 feet, March 14, 1896; G. A. K. Marshall; Mus. Brit.*)

“INTERMEDIATE” FORM OF MALE.—Similar to the “wet-season” form, but with all the black spots and markings greatly reduced; the orange patch on the primaries in some lights showing a metallic shading of mauve, somewhat stronger than in the “wet-season” form. Secondaries entirely white; the black nervular spots on the hind margin, and also the black at the base of the wing, much less heavily indicated; the grey suffusion visible above the median nervules.

Underside.—Primaries white; the apical area sandy-yellow, relieved on the lower half by a faint orange band; the inner margin brownish-black to a little beyond the middle, dusted with grey. Secondaries yellowish-white, dusted with greyish-brown,

the discal transverse band indicated as in the "wet-season" form of the male above described, the spots being somewhat browner in colour. The disco-cellular spots on both wings visible.

Expanse 1·3 inches. (*Spec. ex Tugela River, Natal, 2500 feet, October 22, 1896; G. A. K. Marshall; Mus. Brit.*)

"INTERMEDIATE" FORM OF FEMALE.—Ground-colour of both wings white, the broad brownish mark along the inner margin greyer; the other spots and markings agreeing with those of the female above described. Secondaries; general colour white; the hind-marginal border narrower and lighter in colour.

Underside.—Ground-colour of the primaries white, the apical area sandy-yellow, becoming more orange in colour towards the base; a thin dusky line crossing this yellow patch, from the costa to the third median nervule, where it almost joins the dusky mark on the inner margin, the base greenish-yellow. Secondaries sandy-yellow, dusted with greyish-brown specklings, the brownish discal line faintly indicated; the nervules of both wings terminate in minute black dots on the hind margins.

Expanse 1·2 inches. (*Spec. ex Tugela River, Natal, 2500 feet, October 22, 1896; G. A. K. Marshall; Mus. Brit.*)

"DRY-SEASON" FORM OF MALE.—This form agrees very closely with the "wet-season" form, the black markings on both wings not being so heavily pronounced, and the metallic shading on the orange area of the primaries appearing to be brighter in colour.

Underside.—Central area of the primaries white, the apical area sandy-yellow relieved with orange on the lower half, the usual dusky line also visible. Secondaries entirely sandy-yellow, covered with brownish specklings, the discal line only indicated by a reddish-brown spot at the end of the costal nervure, and a similar spot situated between the third median and first radial nervule.

Expanse 1·4 inches. (*Spec. ex Natal; Mus. Rothschild.*)

"DRY-SEASON" FORM OF FEMALE.—Ground-colour of both wings yellowish-white; the apical area and hind margin brown, the former relieved by five hastate spots of lemon-yellow instead of orange, the same colour visible at the extreme base of the wing; the brown colour on the inner margin less strongly marked; the costa and cilia reddish-buff. Secondaries with the brownish markings not so pronounced, the hind-marginal spots having a suffusion of pale yellow; the discal line more broken than in the other two seasonal forms above described.

Underside.—Discal area of the primaries white, extending to the posterior angle; the apical area reddish-buff, with an orange band on the inner edge, above which follows a dusky line of spots; the inner margin grey, terminating in a black spot, a

little beyond the centre of the wing; the basal area bright yellow. Secondaries entirely reddish-buff, thickly dusted with brown specklings, the discal line and hind margin being also more strongly marked.

Expanse 1·3 inches. (*Spec. ex North East Natal; E. C. Buxton; Mus. Brit.* Type of *T. galathinus*.)

A second form of the female has only the very faintest indication of any spots on the brown apical area of the primaries; the brown spots on the hind margin are larger and more pronounced than in the female above described.

Underside.—Primaries with the apical area sandy-yellow, no orange colour visible, and only the usual dusky line faintly indicated; the inner-marginal line also fainter. Secondaries entirely sandy-yellow, the brownish discal line more connected, although less strongly marked.

Expanse 1·3 inches. (*Spec. ex North East Natal; E. C. Buxton; Mus. Brit.*)

HABITAT.—From Natal to the Zambesi and Nyasa Land.

SOUTH EAST AFRICA (*E. C. Buxton; Mus. Brit.* *Dykes; Mus. Rothschild*). Natal (*Mus. Rothschild*). Tugela River, 2500 feet, October and November 1896 (*G. A. K. Marshall; Mus. Brit.*). Bushman's River (*J. M. Hutcheson; Mus. Brit.*). Weenen, October 1893 (*Mus. Rothschild*). Delagoa Bay (*Mrs. Monteiro; Mus. Brit.*). Zulu Land (*G. F. Angas; Mus. Brit.*). Shiré River (*Hewitson Coll.; Mus. Brit.*). Nyasa Land (*Hewitson Coll.; Mus. Brit.*).

The present species has been the subject of considerable controversy between Dr. Butler and Mr. Guy Marshall. I must admit that the question of the distinctness of *T. cione* from *T. antigone* is a very difficult one, and I do not consider that we have yet sufficient material to enable us to decide the matter.

I have, therefore, contented myself with giving illustrations of the various phases of these two species, as determined by Dr. Butler, who remarks as follows: "The 'wet' and 'intermediate' forms of this species are much alike on the upper surface, the latter, however, with ochraceous apex to primaries and entire surface of secondaries below, whilst the 'dry-season' form is much more lightly marked above, more rosy and irrorated with brown below; next to *T. emini*, it is the most heavily marked dry-season form of its group, and notwithstanding its general resemblance on the upper surface to the wet-season forms of *T. phlegetonia*, I do not consider that we have enough evidence to sink it with its widely differing wet phase as a mere variation of *T. phlegetonia*. When it can be *proved* (instead of *asserted* without proof) that *T. emini*, *T. cione*, *T. antigone*, *T. xanthus*, *T. interruptus*, and *T. glycera* are only variations (uninfluenced by locality or climate) of one and the same species, I shall be one of the first to accept the position. At present I regard it as extremely improbable."

In my opinion, this species is very closely allied to *T. emini*, and may eventually

prove to be identical. The markings of the "wet-season" specimens of this species, in the Natural History Museum, seem to be fairly constant in both sexes, those of the "intermediate" phase being less heavily marked with black in both males and females, the latter varying somewhat as regards the black band on the orange apical area of the fore-wing; one female from the "Cape of Good Hope" having the usual white ground-colour replaced by pale yellow, with a broad brownish-black band traversing the orange apical area on the primaries.

The males of the "dry-season" form (*T. galathinus*, Butl.) have much less black on the wings. The females vary considerably, the majority having the usual orange marks on the primaries, while some exhibit some ochraceous hastate marks, and one example has the entire apical area black.

EXPLANATION OF THE FIGURES OF *T. eione*.

- Plate 41, fig. 1 ♂ Tugela River, Natal (*G. A. K. Marshall*; *Mus. Brit.*).
 „ 1a. Underside of fig. 1.
 „ 1b. ♀ Tugela River, Natal (*G. A. K. Marshall*; *Mus. Brit.*).
 „ 1c. Underside of fig. 1b.
 „ 1d. ♂ Tugela River, Natal (*G. A. K. Marshall*; *Mus. Brit.*).
 „ 1e. Underside of fig. 1d.
 „ 1f. ♀ Tugela River, Natal (*G. A. K. Marshall*; *Mus. Brit.*).
 „ 1g. Underside of fig. 1f.
 „ 1h. ♂ Natal (*Mus. Rothschild*).
 „ 1i. Underside of fig. 1h.
 „ 1j. ♀ North East of Natal (*E. C. Burton*; *Mus. Brit.*).
 „ 1k. Underside of fig. 1j.
 „ 1l. ♀ North East of Natal (*E. C. Burton*; *Mus. Brit.*).
 „ 1m. Underside of fig. 1l.

TERACOLUS XANTHUS, Swinhoe.

(Plates 42 and 43, figs. 1, 1a-1p.)

Teracolus xanthus, Swinhoe, P. Z. S. 1884, p. 440, pl. xxxix. f. 10; Butler, P. Z. S. 1897, p. 693; *id.* P. Z. S. 1898, p. 410; *id.* Ann. and Mag. Nat. Hist. (6) xx. p. 462 (1897).

Teracolus comptus, Butler, P. Z. S. 1888, p. 94; *id.* P. Z. S. 1896, p. 246.

Teracolus bifasciatus, E. M. Sharpe, Ann. and Mag. Nat. Hist. (6) v. p. 336, 1890; Waterhouse, Aid Ident. Ins. pl. clxxxix. (1890, ♀); Hampson, Ann. and Mag. Nat. Hist. (6) v. p. 181 (1891).

Teracolus metagone, Holland, Proc. U. S. Nat. Mus. xviii. p. 760 (1896); Butler, Ann. and Mag. Nat. Hist. (6) xx. p. 462 (1897); Aurivillius, Rhop. Æthiopica, p. 141 (1898).

Teracolus evagore, (part), Guy Marshall, P. Z. S. 1897, p. 35.

Teracolus दौरα, (part), Aurivillius, *l.c.* p. 435 (1898).

Teracolus xanthus, var. *metagone*, Butler, P. Z. S. 1899, p. 970.

Distinguished from *T. antigone* by the absence of the sulphur-yellow suffusion at

the base, on the underside ; also by the black hind-marginal border on the secondaries being much less heavily indicated.

MALE.—Central area of the primaries white ; the apical area bright orange yellow ; the upper half of the costa, apex, and hind margin brownish-black ; a broad line of the same colour along the inner margin and united to the orange patch by a thin dusky line terminating in a brownish spot ; two white spots near the posterior angle. Secondaries white, the base and costal margin brownish black ; the hind-marginal border also brownish-black, but much broken up by white streaks between the nervules ; cilia white.

Underside.—The central area to the posterior angle white ; the inner margin greyish-brown united to the orange band by the grey streak as on the upper side ; the apex greenish-yellow ; a minute black dot at the end of the cell. Secondaries white ; the costal margin bright orange, a spot of the same colour as well as the usual black dot being in evidence at the end of the cell.

Expanse 1·3 inches. (*Spec. ex Teita, December 1891 ; F. J. Jackson.*)

FEMALE.—Primaries with a distinct curved white band, commencing narrowly at the base and gradually broadening to the posterior angle ; a broad band of brownish-black along the inner margin to a little beyond the middle of the wing ; a distinct brown spot at the end of the cell ; the apical area and hind margin brownish-black, the former showing a faint yellow spot. Secondaries with the discal area white, thickly dusted with brownish-grey on the inner margin ; the base and costal margin, as well as the hind margin, brownish-black, the latter somewhat relieved with minute white streaks ; a thin dusky line uniting the hind-marginal border to the dark costal patch.

Underside.—The white band mentioned above tinged with pale yellow at the base ; the inner margin grey with a black spot at the end, near the posterior angle ; the orange patch edged on the apex with sulphur-yellow ; the usual black dot at the end of the cell. Secondaries with the ground-colour yellowish-white, the usual costal streak and discoidal spot of orange visible ; the faintest line traversing the discal area.

Expanse 1·4 inches. (*Spec. ex Teita, December 1891 ; F. J. Jackson.*)

A second form of the "wet-season" female differs from the one fully described above, in having the white ground-colour on the primaries pale yellow ; the dark apical patch relieved by a band of five distinct orange spots ; a second line of orange visible where the brown and white colours unite. Secondaries with the white ground-colour suffused with pale yellow ; the brownish-black hind-marginal border broken up by yellowish-white spots varying in size ; the other spots and markings agreeing with those of the female fully described above.

Underside.—Somewhat darker in colour, especially on the secondaries ; the reddish-buff line crossing the discal area rather more strongly indicated.

Expanse 1·3 inches. (*Spec. ex Kibaoni, Ukamba, April 19, 1898; Dr. J. W. Ansorge; Mus. Rothschild.*)

“INTERMEDIATE” FORM OF MALE.—Primaries similar to those of the male above described, but somewhat smaller, the orange patch fainter in colour, and the black on the hind and inner margin much narrower, especially on the latter. Secondaries white, dusky grey at the base; the nervules terminating in small brownish-black spots.

Underside.—With the exception of the black and orange markings being fainter in colour, the underside agrees with that of the male fully described above.

Expanse 1·1 inches. (*Spec. ex Sabaki River; Keith Anstruther; Mus. Brit. Type of T. bifasciatus.*)

“INTERMEDIATE” FORM OF FEMALE.—Very similar to the second form above described (fig. 1d) as regards the dusky-brown markings on both wings; the ground-colour of both primaries and secondaries white instead of sulphur-yellow, with the inner line of orange-yellow on the apical area larger.

Underside.—General colour paler than in the female form (fig. 1e).

Expanse 1·3 inches. (*Spec. ex Tsavo River, January 1892; F. J. Jackson. Type of T. bifasciatus.*)

Another form of the “intermediate” male, which Dr. Butler considers to be *T. metagone*, Holland, has the orange-yellow apical area on the primaries larger, and the usual dusky band along the inner margin entirely absent, and the dusky-brown marginal spots slightly reduced on both wings.

Underside.—Similar to that of the male (fig. 1g).

Expanse 1·1 inches. (*Spec. ex Arusa Galla Country, between October 1 and November 19; F. Gillett; Mus. Brit.*)

“DRY-SEASON” FORM OF MALE.—Ground-colour of the primaries yellowish-white, the orange colour on the apical area very bright and relieved by a small brown spot on the third median nervule; the brownish hind-marginal border terminating on the first median nervule; cilia reddish in colour. Secondaries white, with minute brown spots at the end of the nervules, those of the radial nervules being slightly larger.

Underside.—Ground-colour white, the apical area tawny yellow, with a band of deep orange near the inner edge of the lighter colour; the extreme edge of the apex and hind margin rather warmer yellow to as far as the second median nervule, when the remainder is white. Secondaries entirely sandy-pink with faint vermiculations of brown; the usual minute spot visible at the end of the cell.

Expanse 1·1 inches. (*Spec. ex Loangwa River, Nyasa Land, September 12, 1895, R. Crawshaw, Mus. Brit.*)

“DRY-SEASON” FORM OF FEMALE. Ground-colour of the primaries pale sulphur-yellow; a broad dusky brown band on the inner margin, extending a little beyond

the middle of the wing; the apical area orange-yellow, crossed by a narrow band of brown, which is united to the inner-marginal band by a faint dusky line; the apex and hind margin brown. Secondaries entirely sulphur-yellow, the base and costa dusky brown; the nervules on the hind margin terminating in distinct brown spots; a dusky brown shading visible just above these spots, and extending over the median and radial nervules.

Underside.—Primaries pale sulphur-yellow; the orange apical band narrow, lined on the outer edge by five small internervular spots of dusky brown, the apex pale orange yellow, faintly dusted with brown; a grey streak visible along the inner margin, but not extending to the posterior angle. Secondaries pale pinkish-yellow; the costa, base and nervules terminating on the hind margin, pale greenish-yellow, with a faint shading of the same colour extending over the median nervules, above the marginal spots.

Expanse 1·2 inches. (*Spec. ex Mpeta, Loangwa River, Nyasa Land, November and December 1895. J. T. Coryndon; Mus. Rothschild.*) ("Caught at the commencement of the rainy season.")

A second form of the female resembles the one above described as regards the ground-colour and the brownish-grey markings; the brown apical area on the primaries relieved by four pale yellow hastate spots, somewhat deeper than the ground-colour; a minute greyish spot above the inner-marginal line, giving a faint indication of extension to the apical area; the brownish-grey transverse discal line on the secondaries somewhat more strongly indicated.

Underside.—Primaries pale yellow, the apical area rather deeper in colour, with faint vermiculations; a transverse line of brown internervular spots crossing the inner edge of the apical area; the usual grey inner-marginal line terminating in two brown spots, one almost obsolete, just before the posterior angle. Secondaries sandy-yellow, thickly covered with brownish vermiculations, the brown transverse discal line fairly well pronounced.

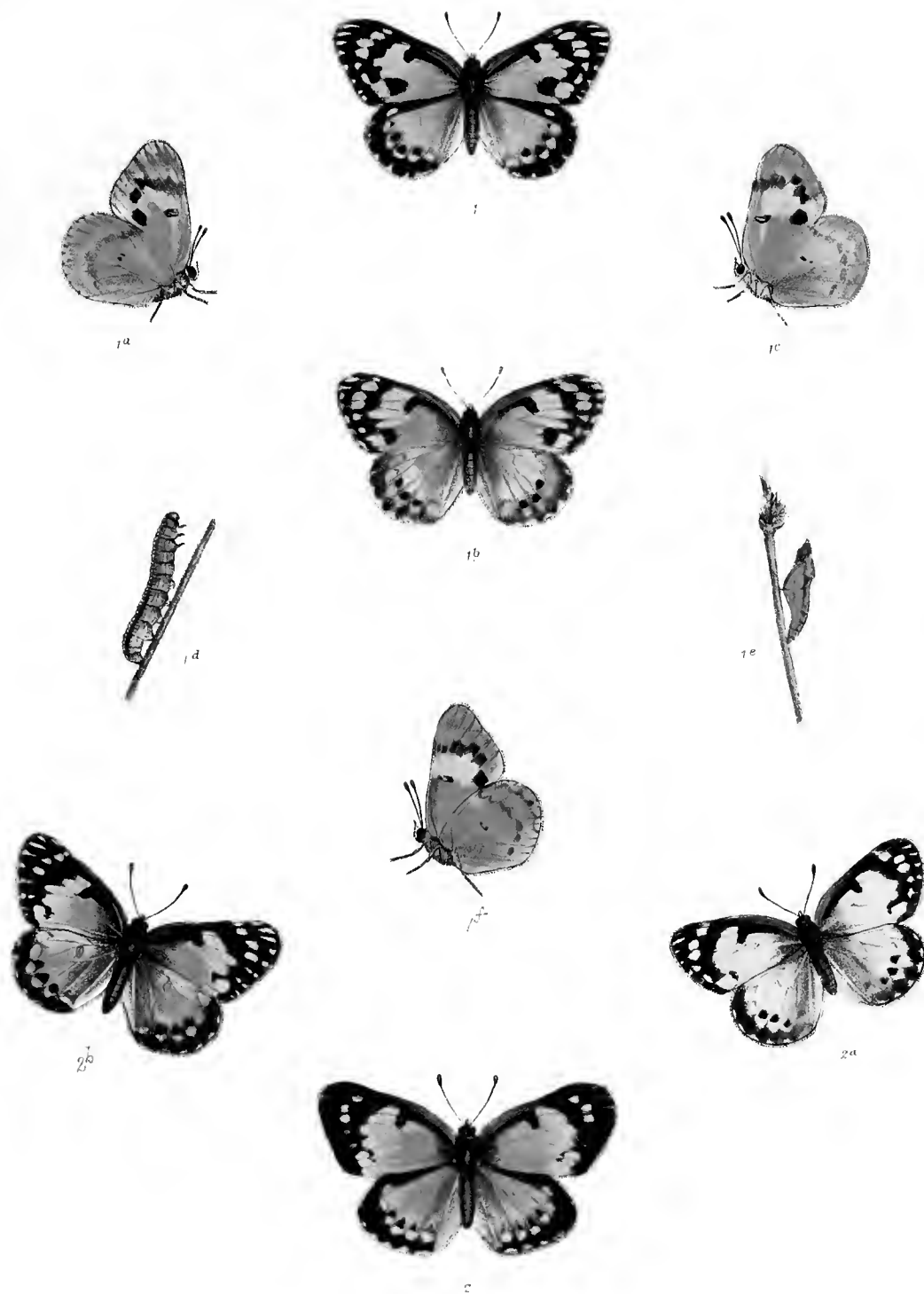
Expanse 1·2 inches. (*Spec. ex Athi River; Lord Delamere; Mus. Brit.*)

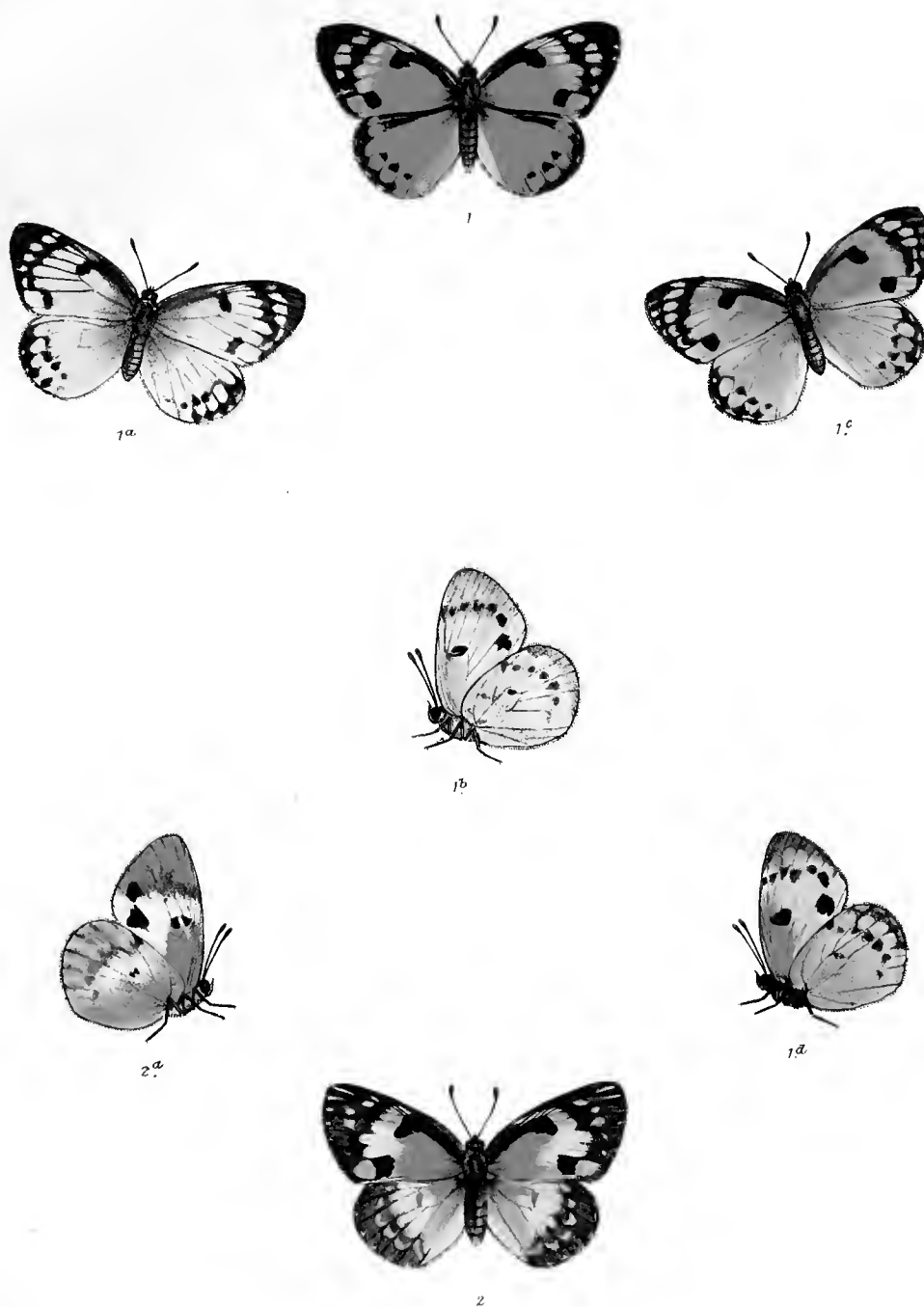
HABITAT.—Senegambia to N. E. Africa through E. Africa to Nyasa Land, and to Benguela in S. W. Africa.

SOUTH WEST AFRICA.—Chubia; Bengula; April 5, 1898 (*Cooper; Mus. Rothschild*).

WEST AFRICA.—Gambia (*Crowley Coll; Mus. Brit.*).

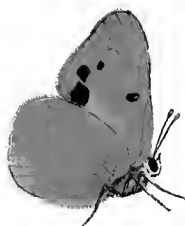
NORTH EAST AFRICA.—Salomona, Erithrea, December 9, 1897 (*Schrader; Mus. Rothschild*). Zeila, Somali Land; April 1895 (*Capt. Nurse, Cf. Butler P. Z. S., 1896, p. 254*). Sheik Husein; Upper Shebeli River; September 19, 1894 (*Dr. Donaldson Smith; Mus. Rothschild*). Sheik Mahomet; September 26, 1894 (*Dr. Donaldson Smith; Mus. Rothschild*). Arusa Galla Country; November 1896 (*F. Gillett; Mus. Brit.*). White Nile (*Consul Petherick; Mus. Brit.*).







1a



1c



1b



1



2



2a



1.



1b



1a



1d



1e



1f



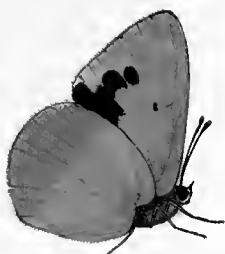
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1h



1



1a



1c



1b



1d



1e



7a



7c



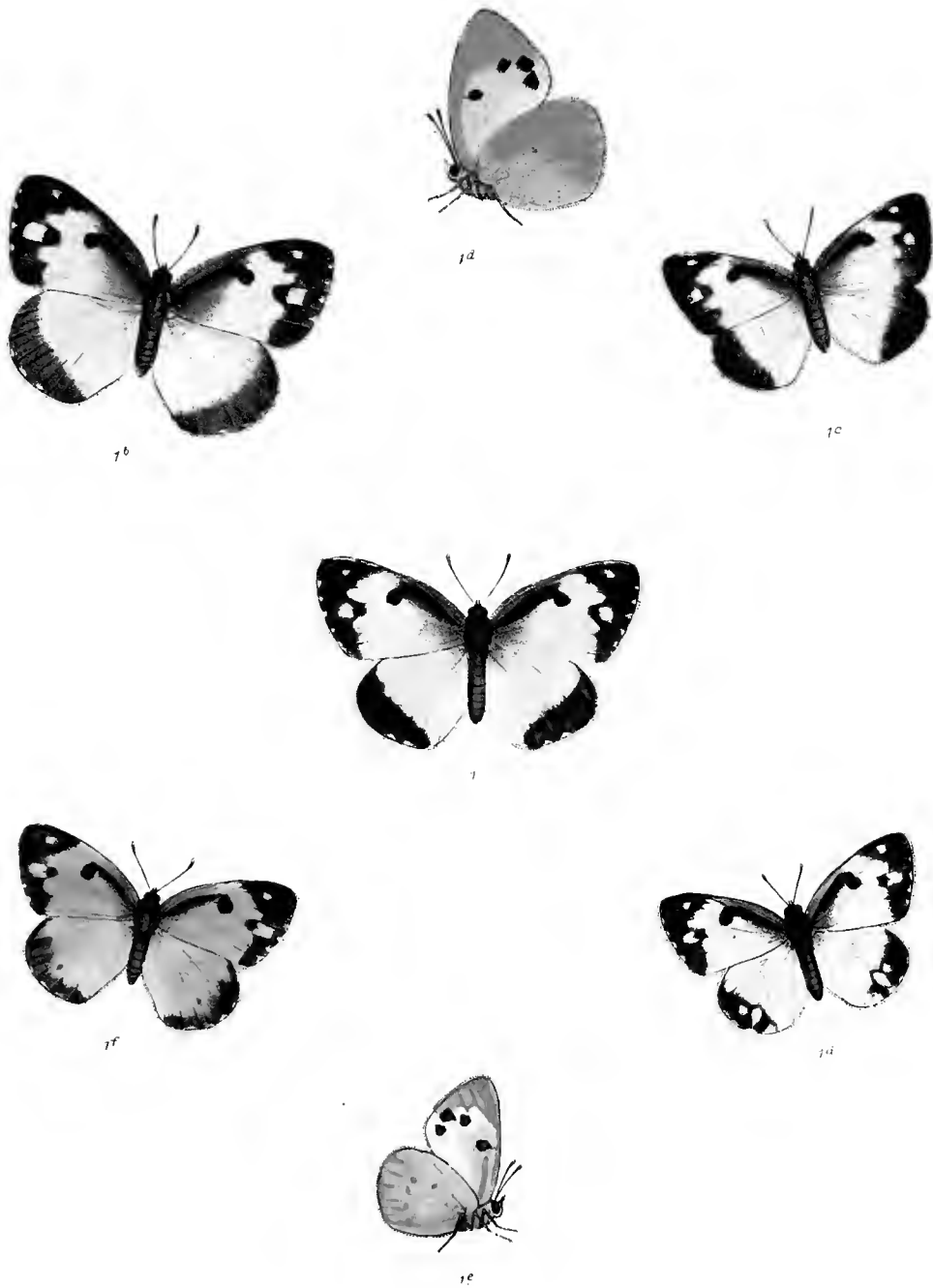
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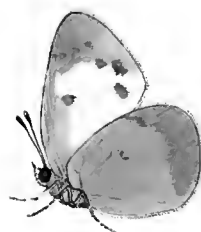
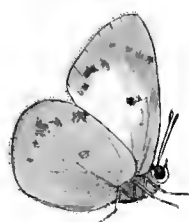


7a

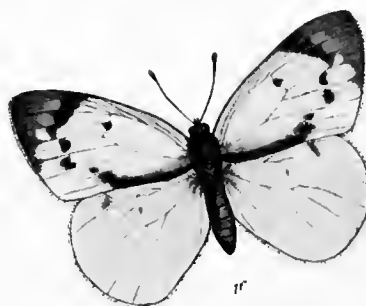
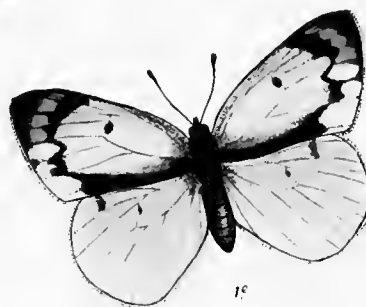


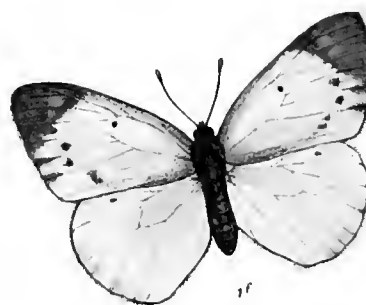
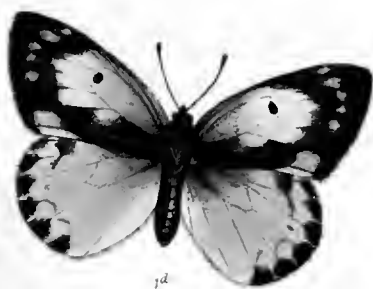
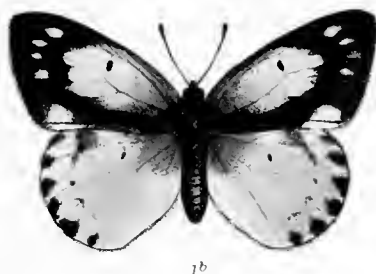
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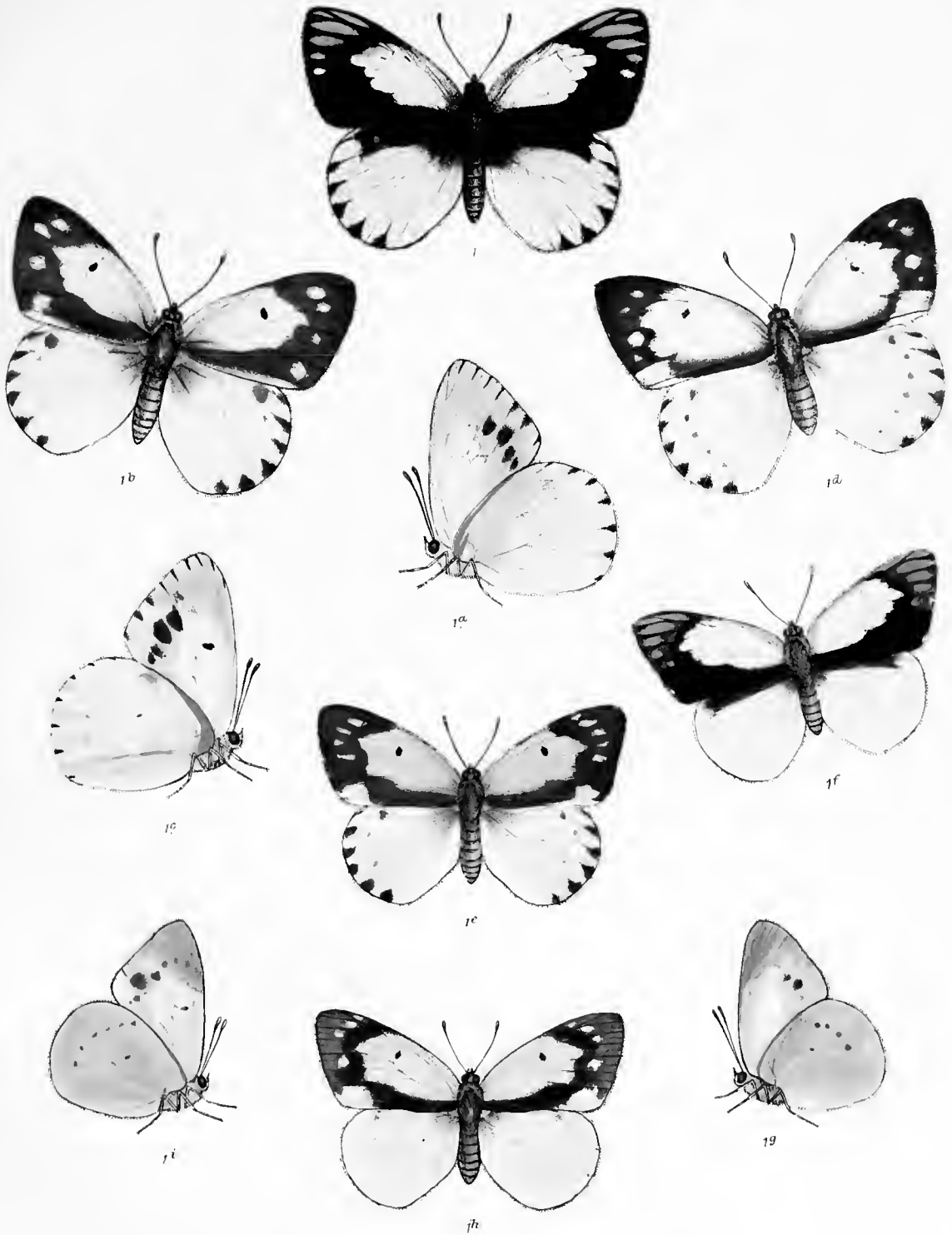














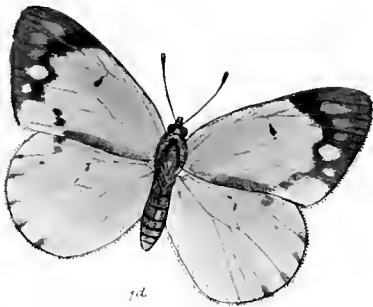
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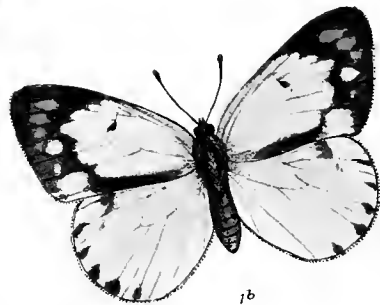
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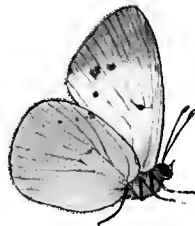
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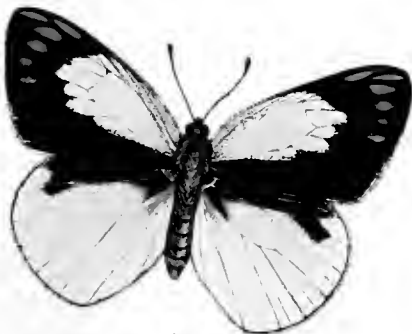
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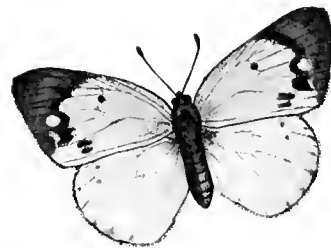
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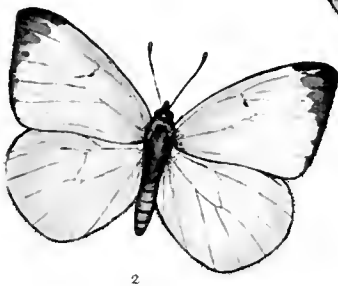
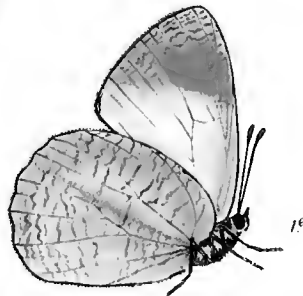
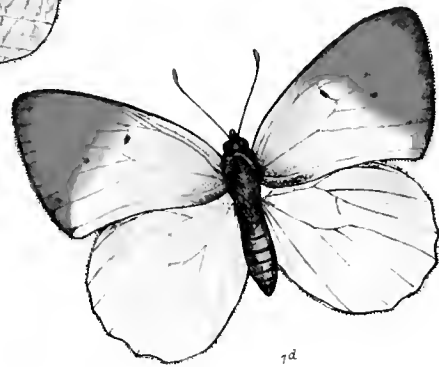
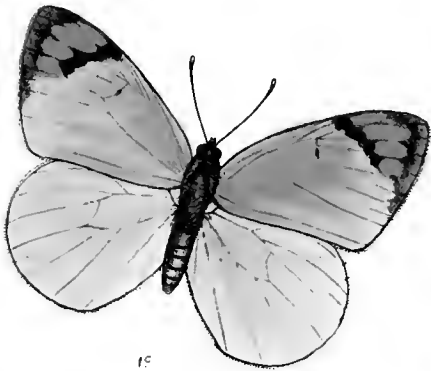
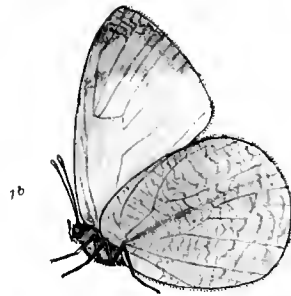
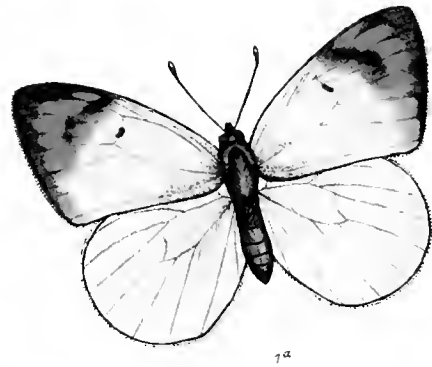
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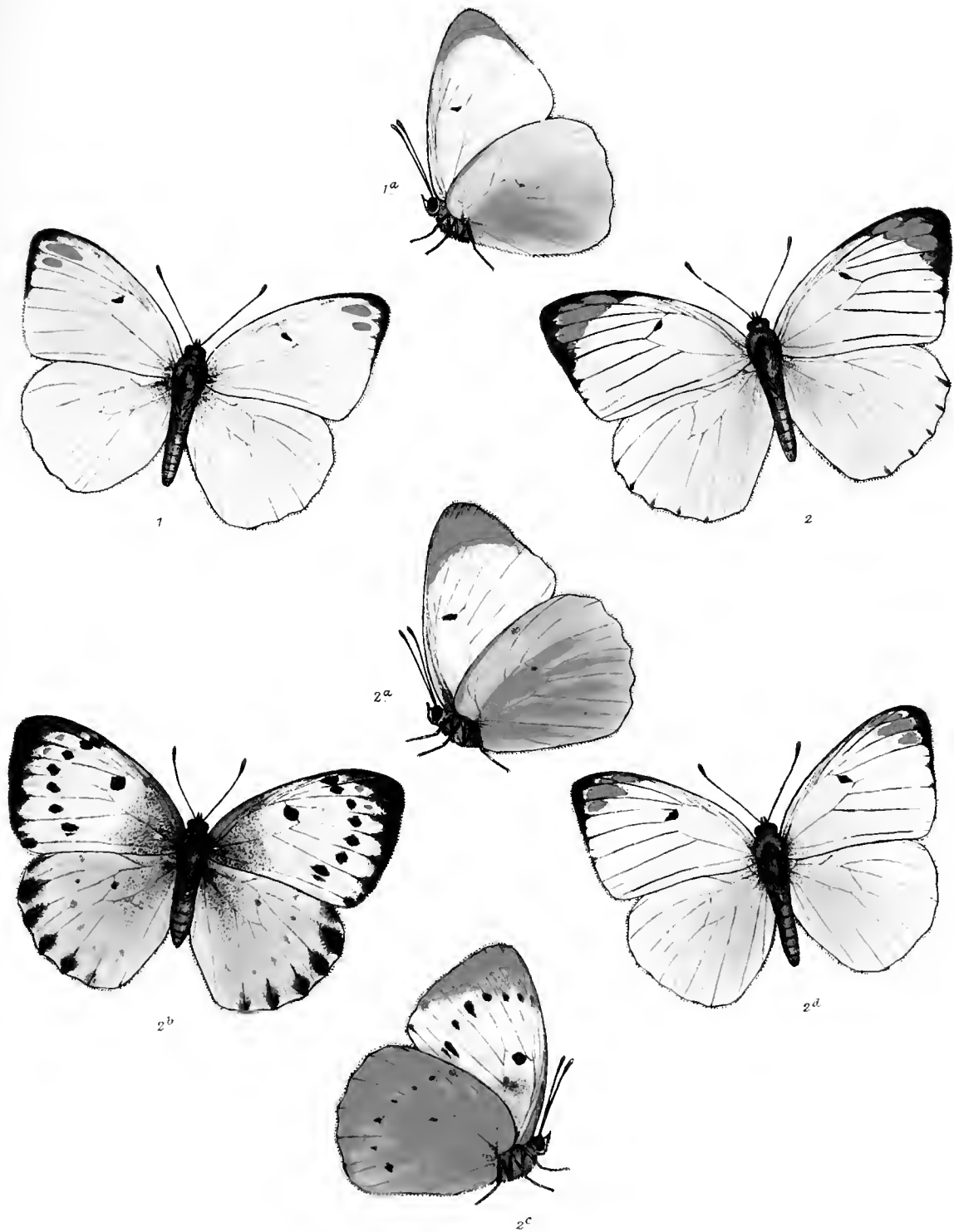


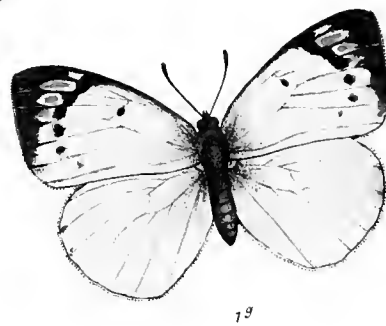
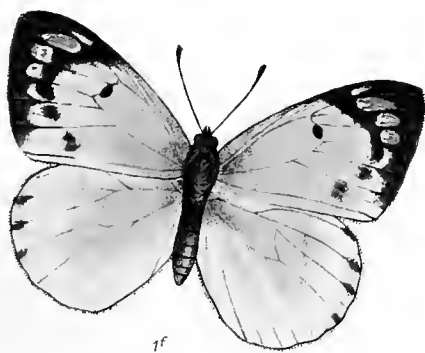
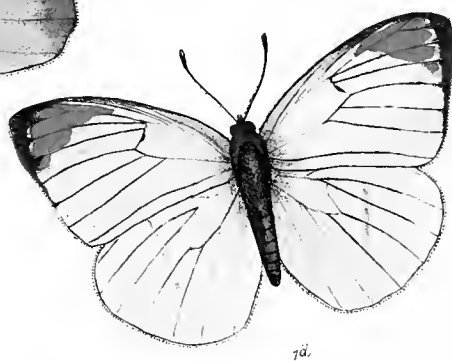
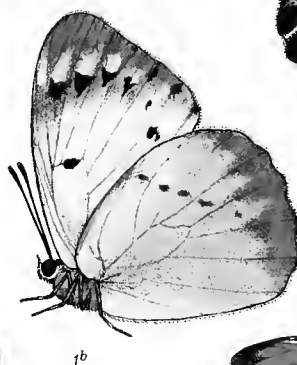
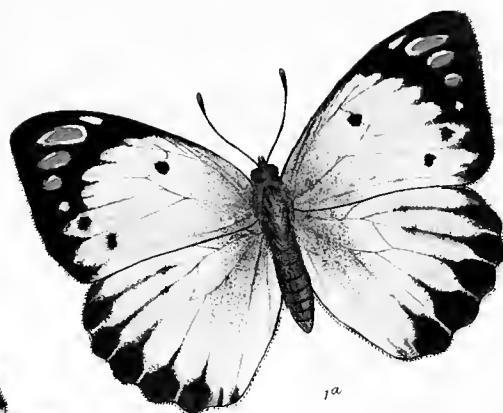
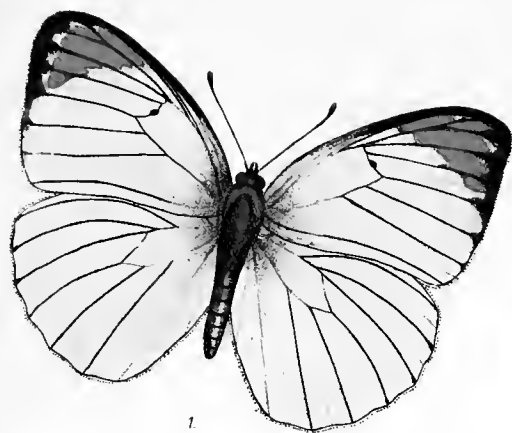
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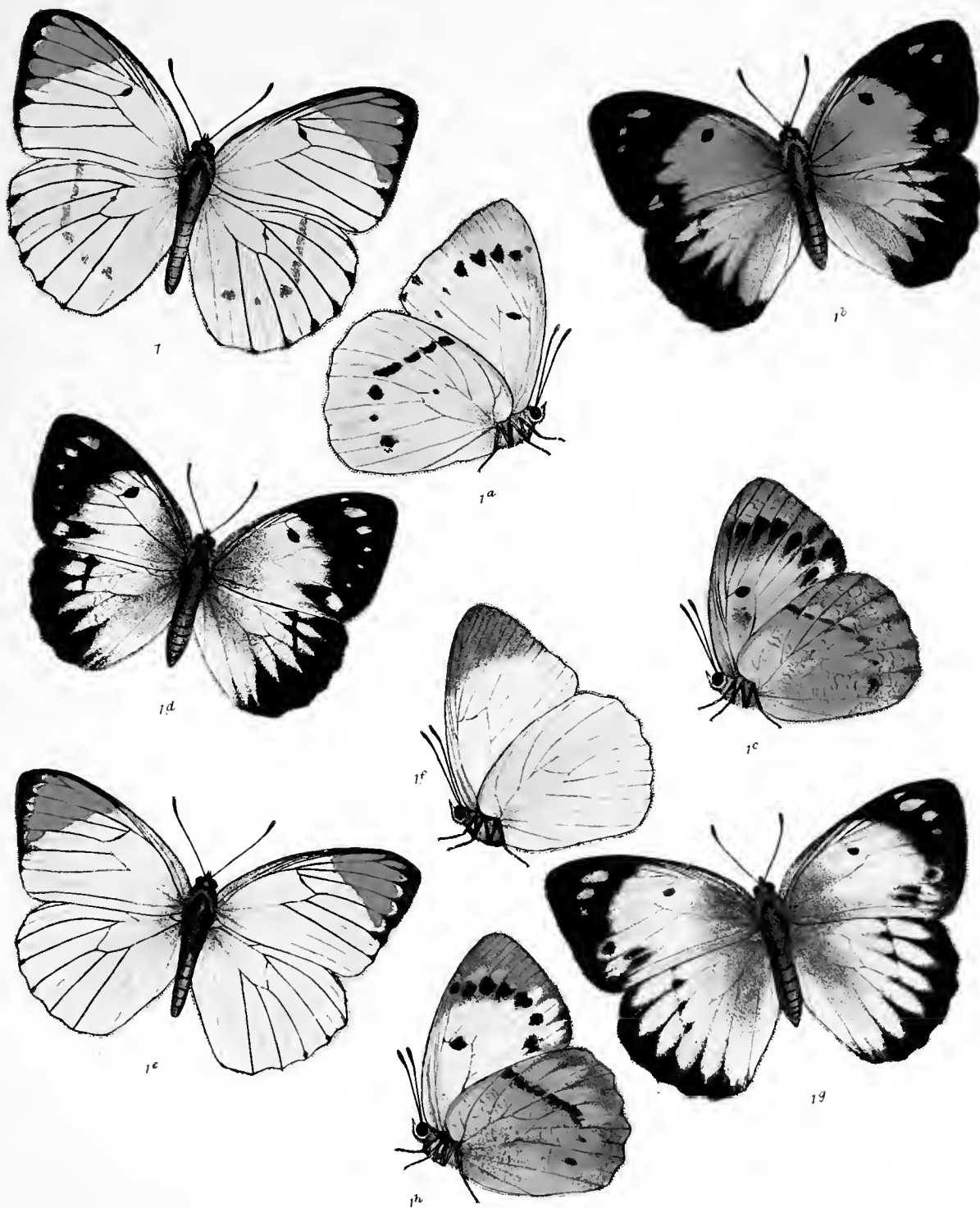


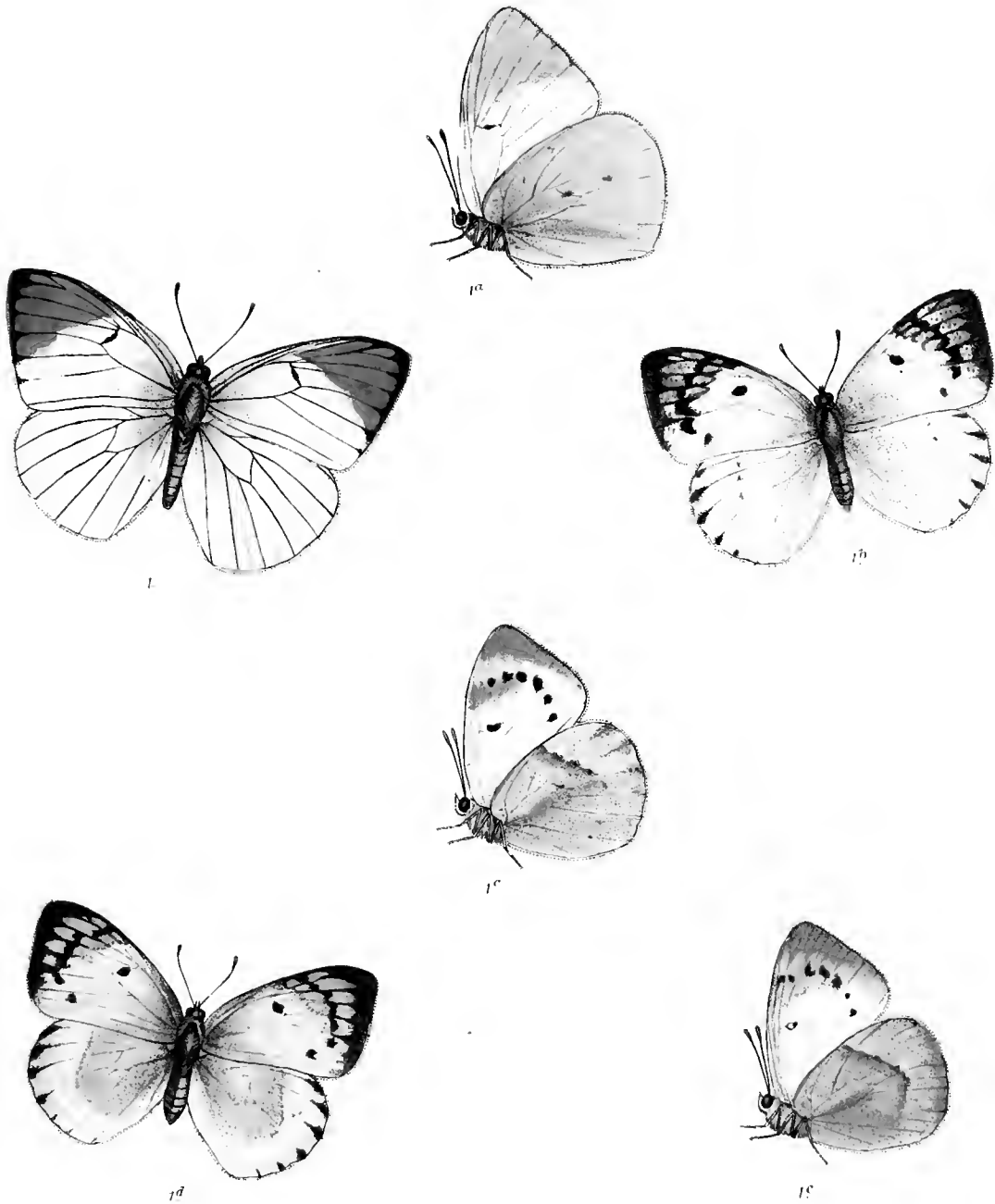
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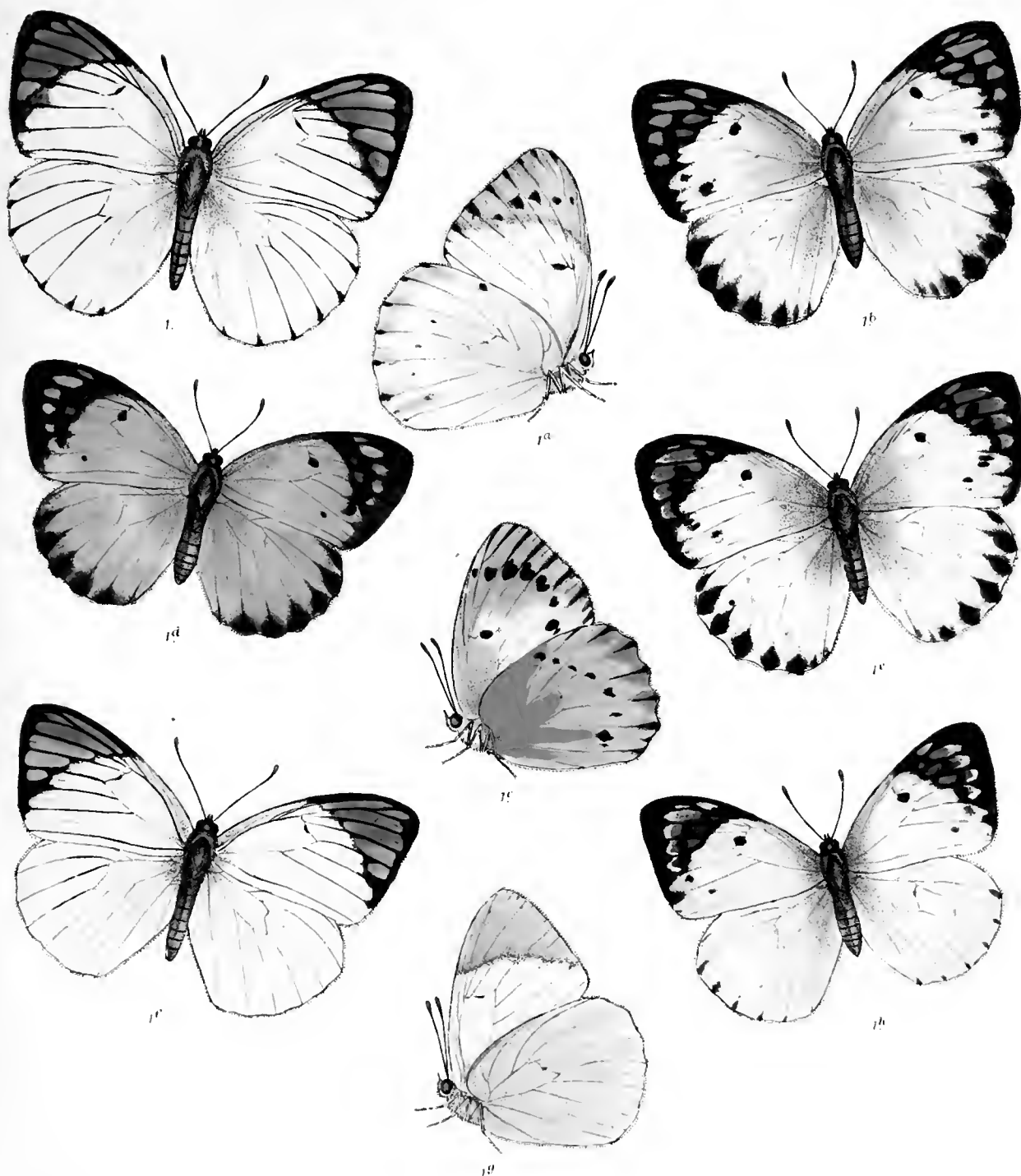


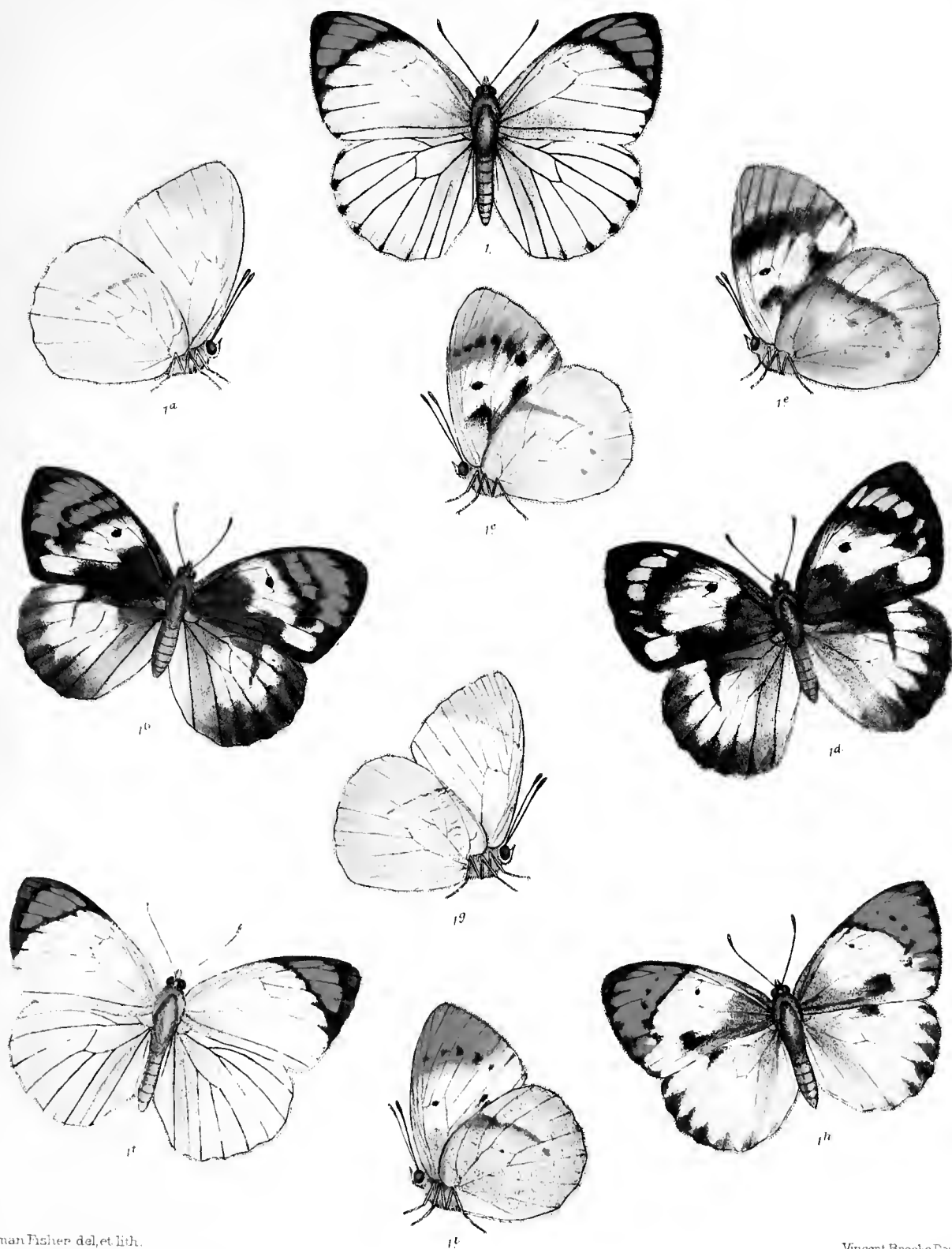












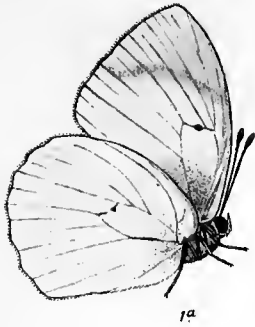
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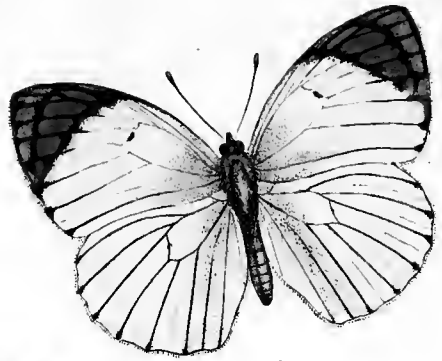
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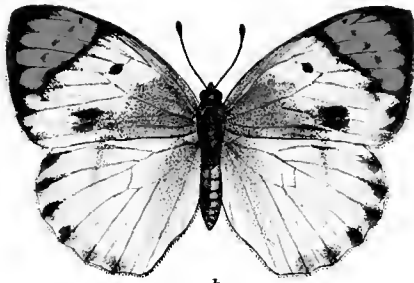




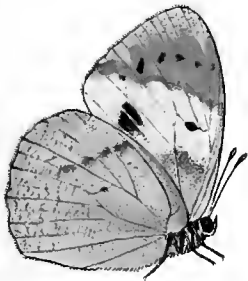
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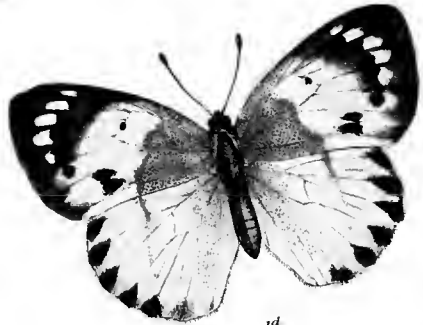
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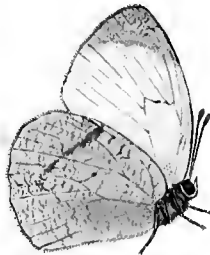
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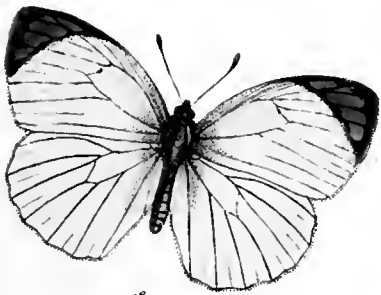
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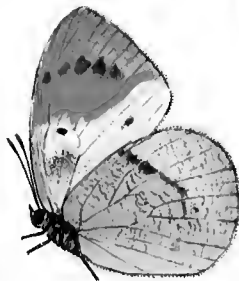
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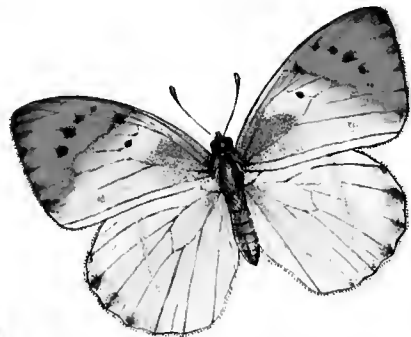
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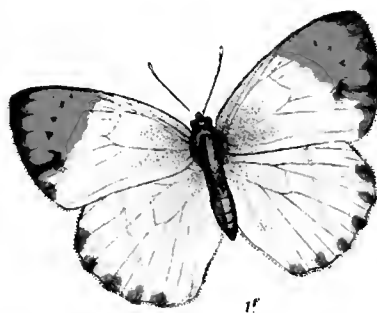
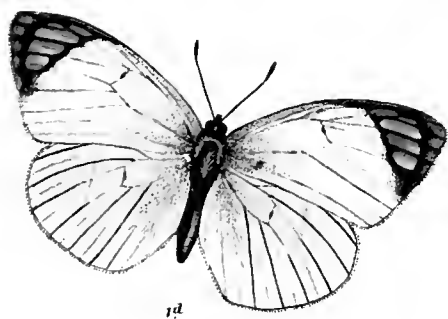
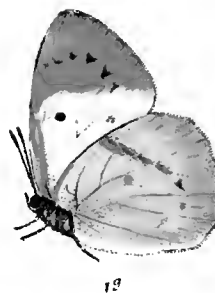
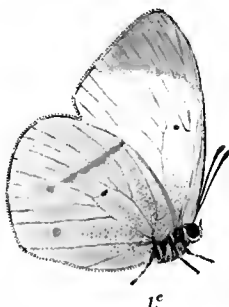
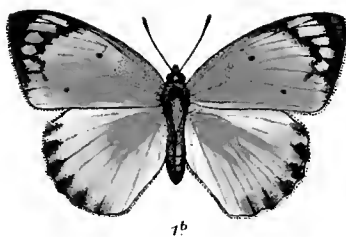
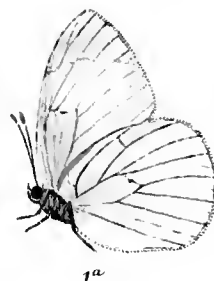
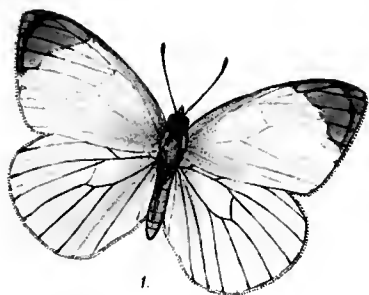
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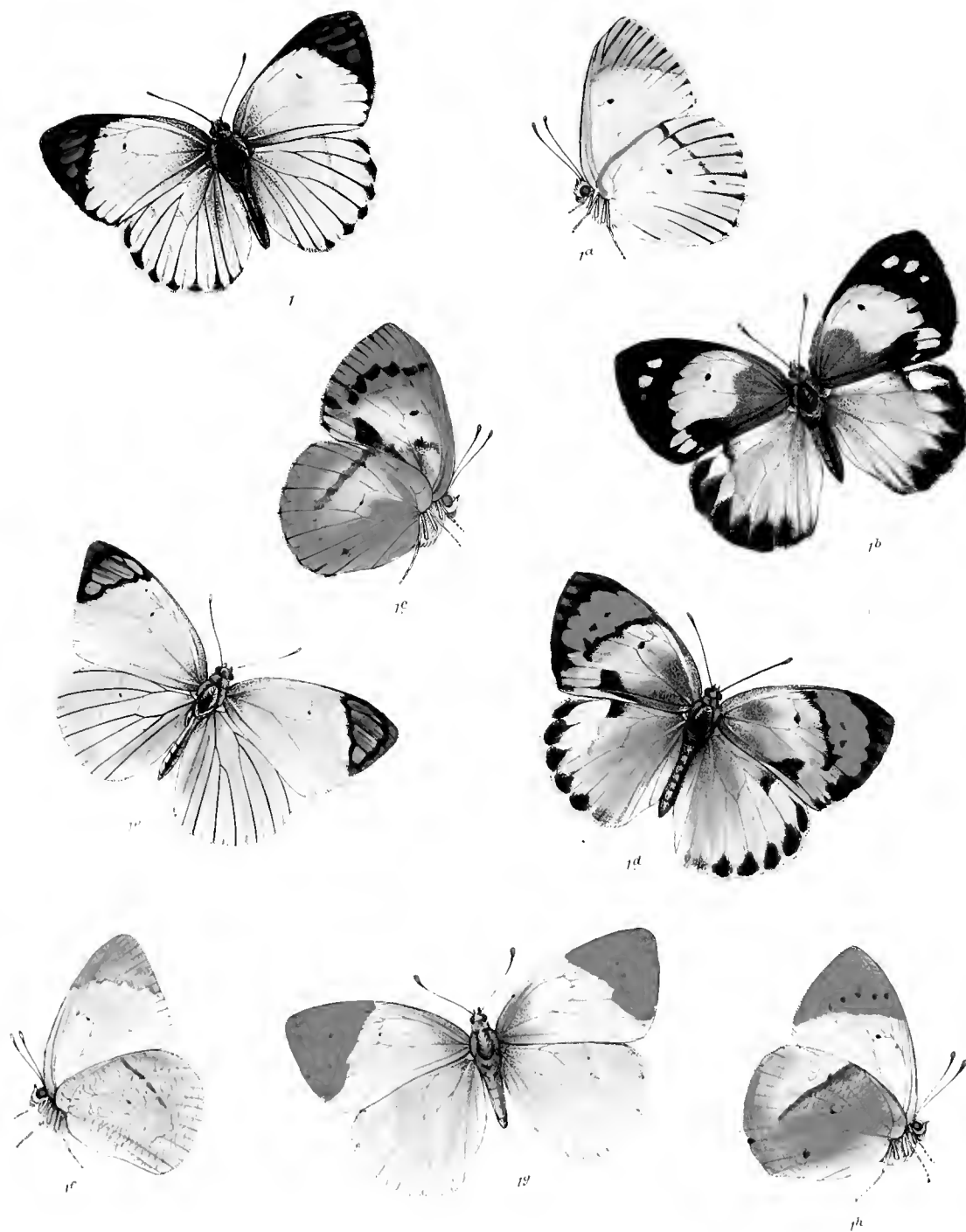


1^g



1^h







L



L^v



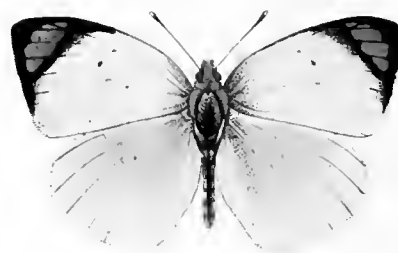
L'



L''



L''^v



L'''



L''



L''^v



L''



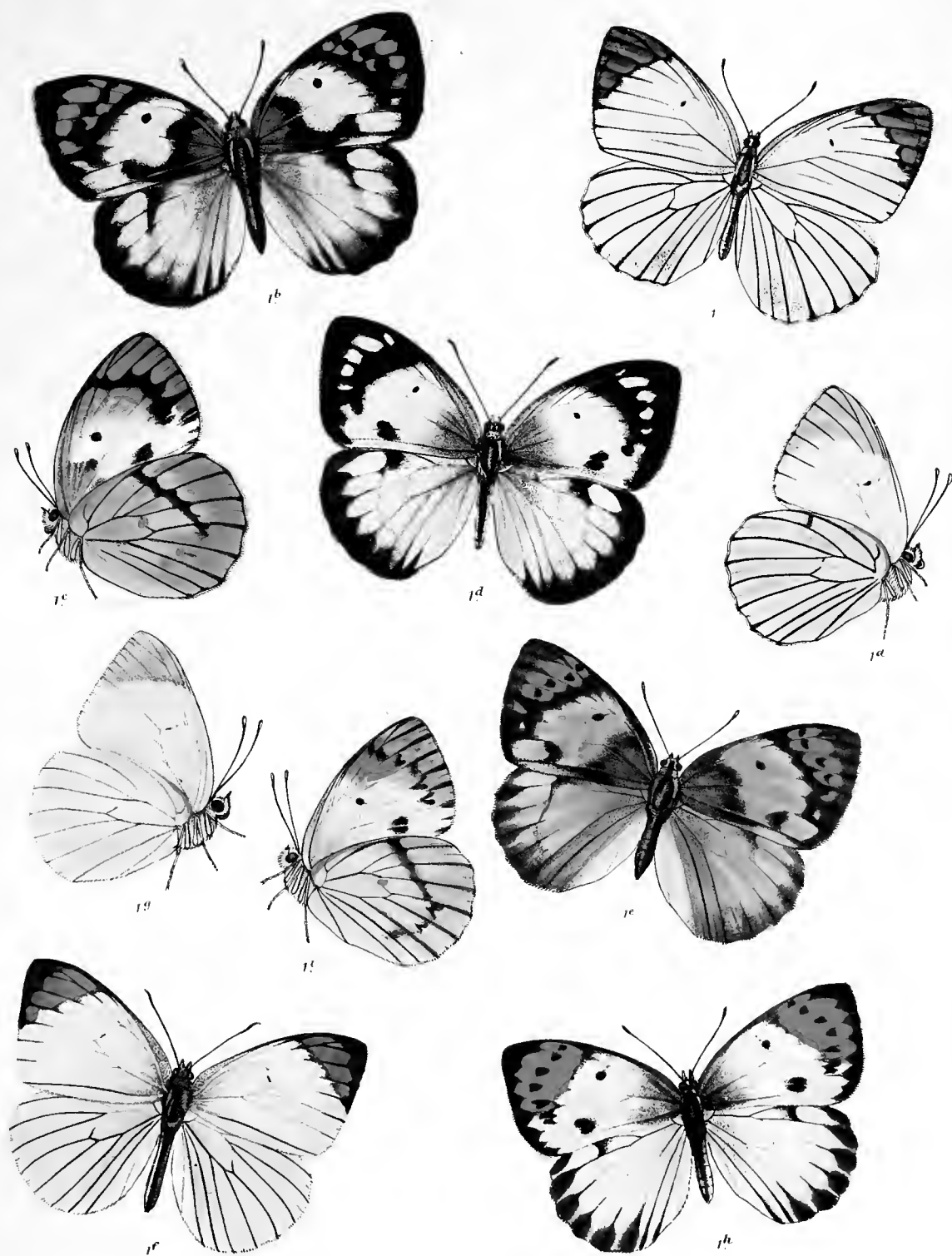
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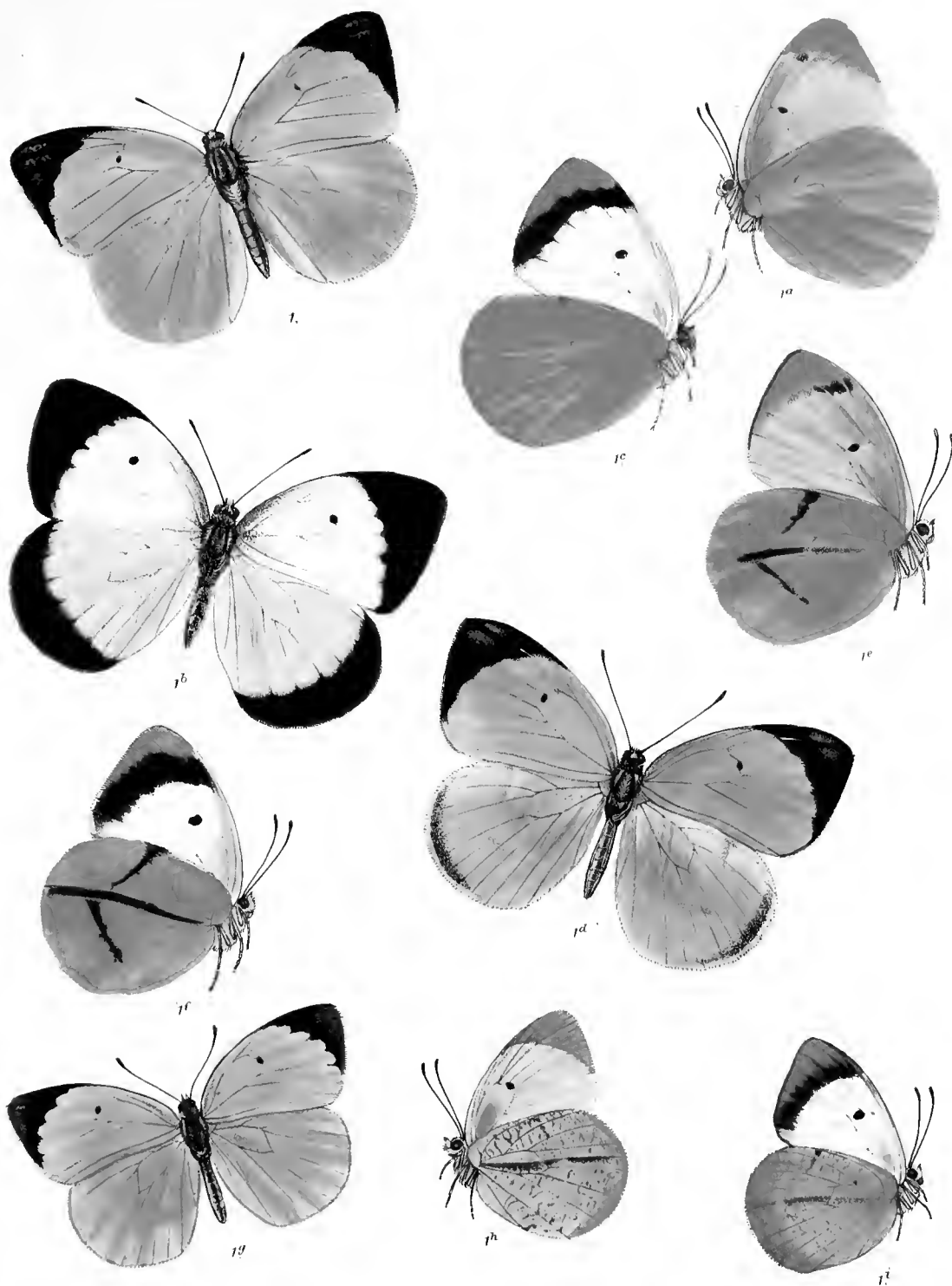


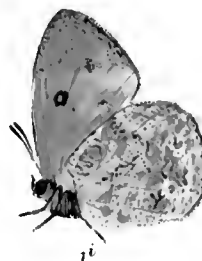
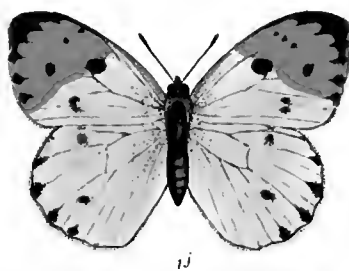
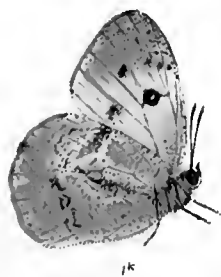
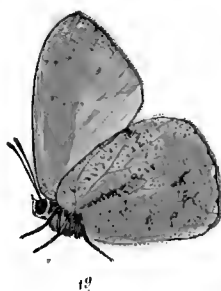
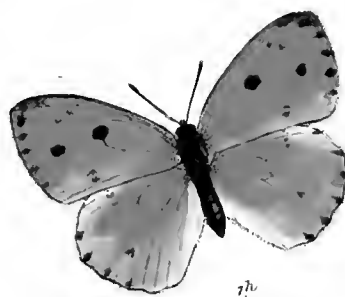
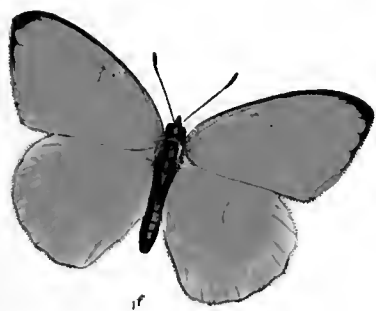
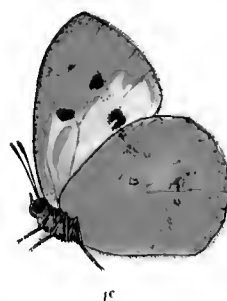
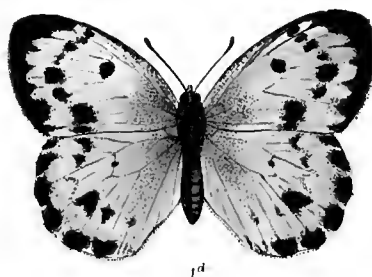
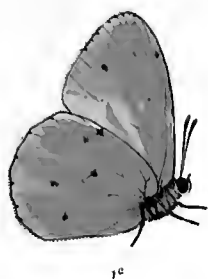
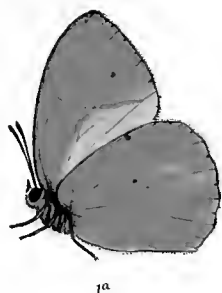
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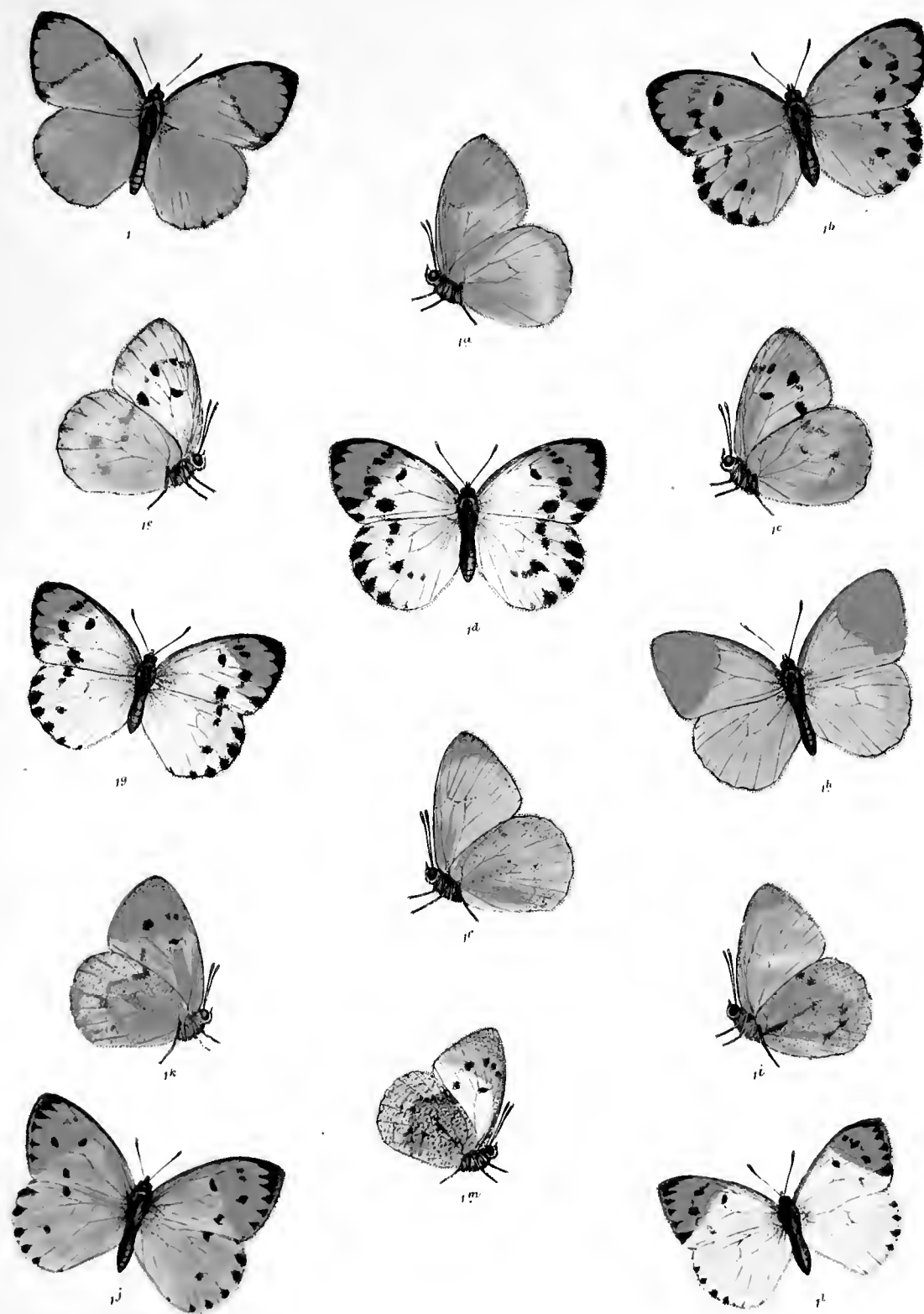


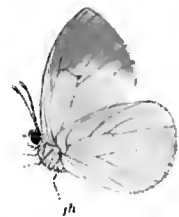
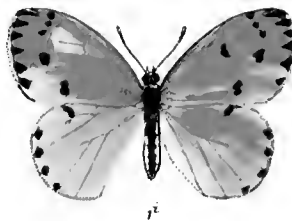
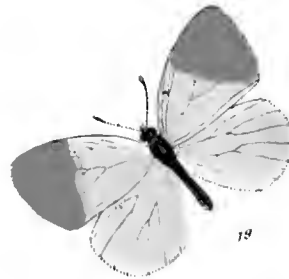
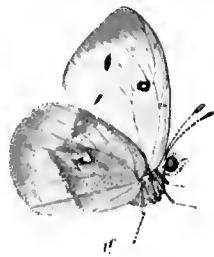
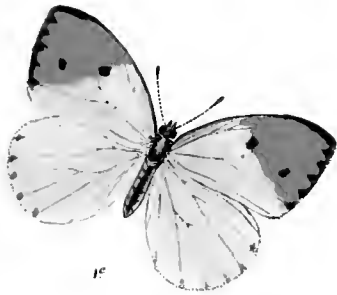
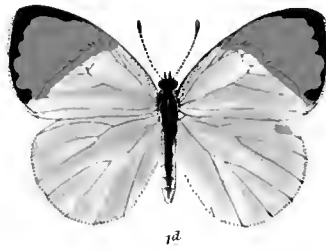
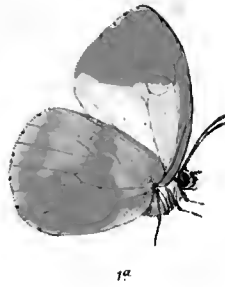
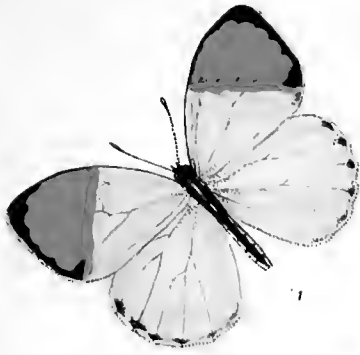
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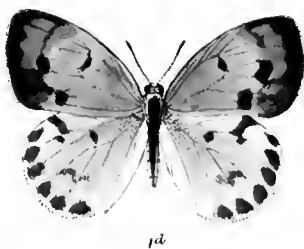






E.C. Knight ad nat. lith.

Vincent Brookes, Day & Son Ltd Imp.

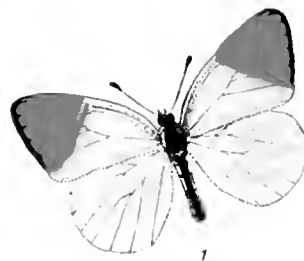


E.C. Mught. ad nat. h. th.

Vincent Brooks Day & Son Ltd Imp



1a



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1b



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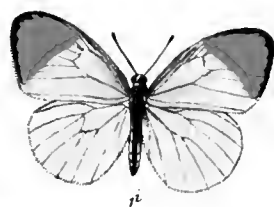
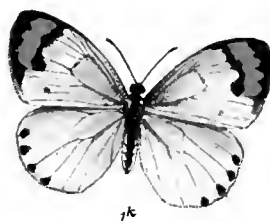
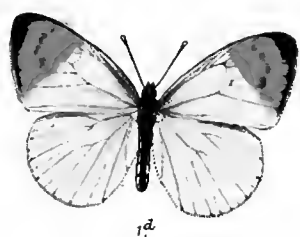
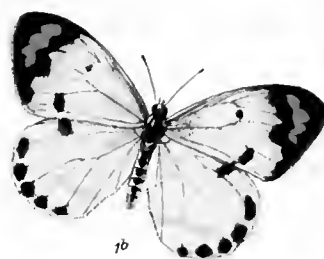
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1g

E.C. Knight ad nat. hist.

Vincent Brooks Day & Son Ltd Imp.

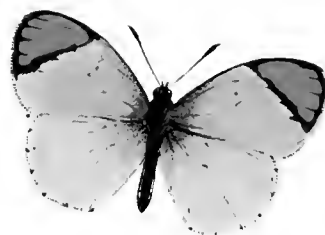


E. C. Knight adnat bth

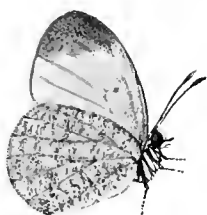
Vincent Brooks Day & Son Ltd Imp



1b



1



1a



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E.C. Knight ad nat del

Vincent Brooks, Day & Son Ltd Imp



1



1a



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E.C. Knight ad nat del

Vincent Brooks, Day & Son Ltd Imp





1



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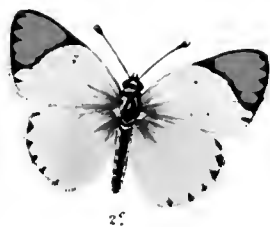
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2a









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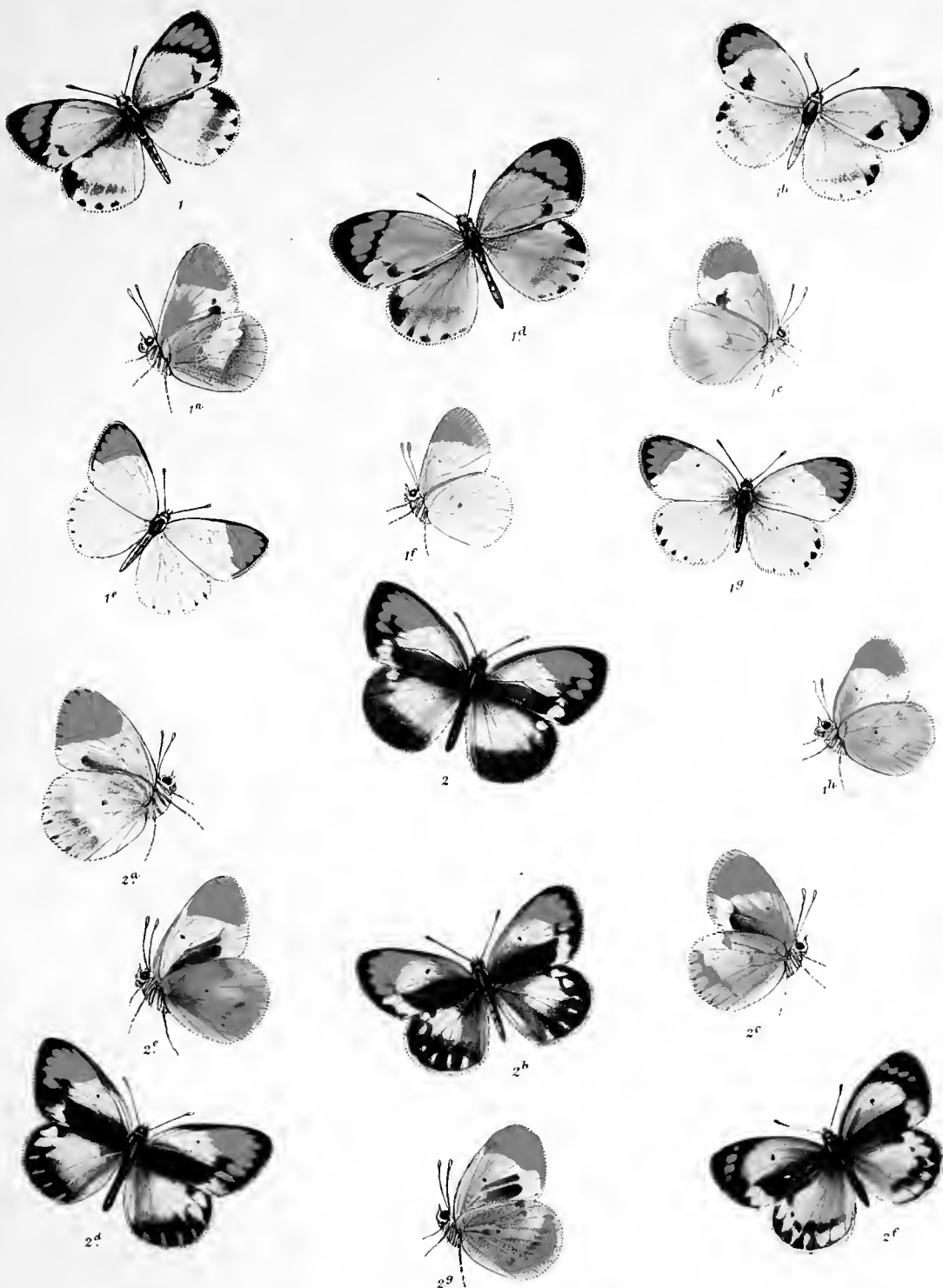
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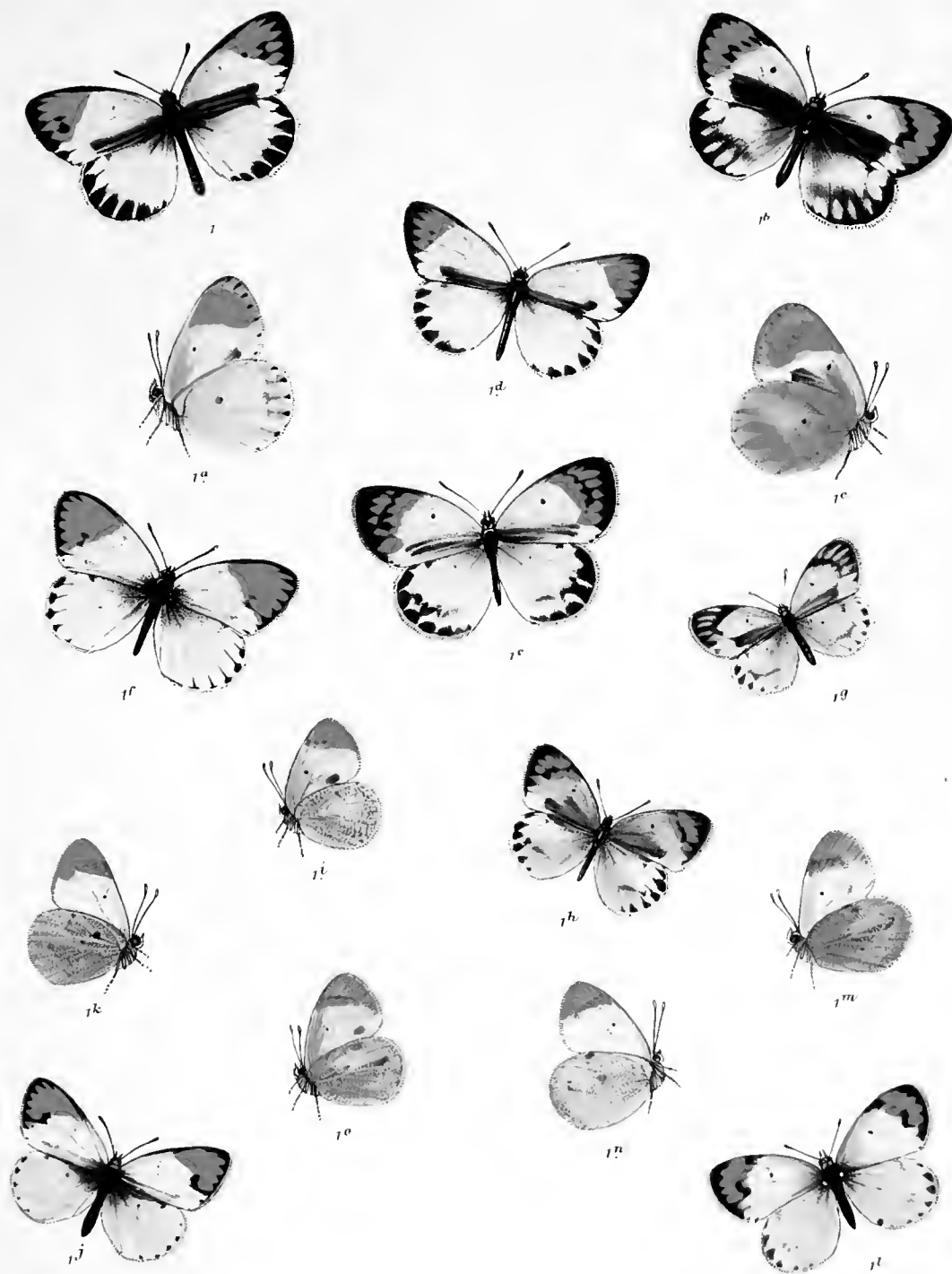


14



Horace Knight del et lith

Vincent Brooks, Day & Son, Litho



Horace Knight del. et. lith.

Vincent Brooks & Son Ltd. Imp.





H Knight del et lith

Vincent Brooks, Day & Son Ltd Imp

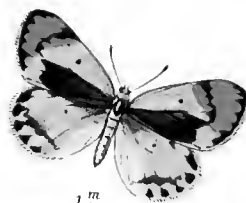
L Reeve & Co London



1^k



1^l



1^m



1^p



1^o



1ⁿ



2



2^a



2^b



2^c



2^e



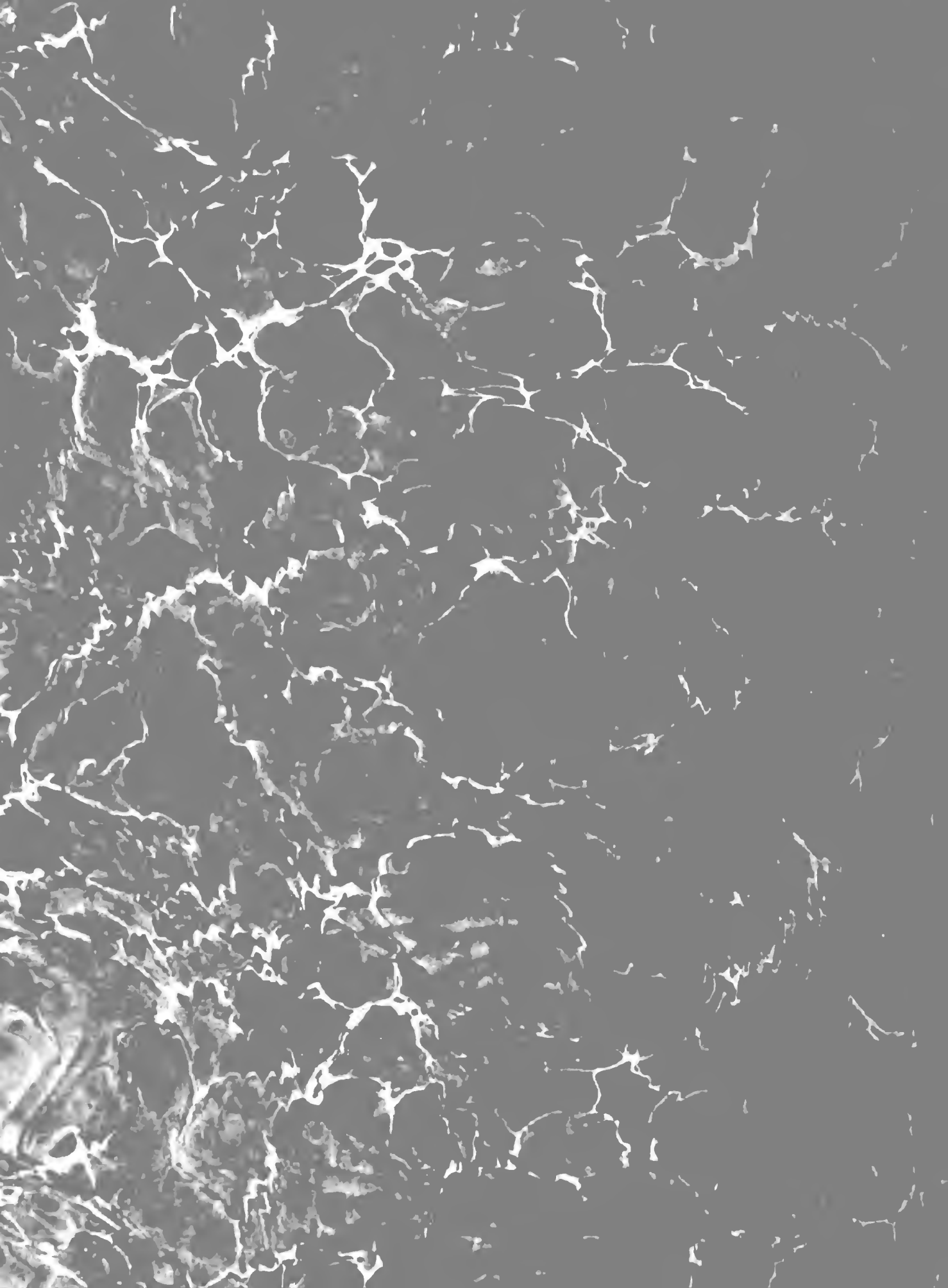
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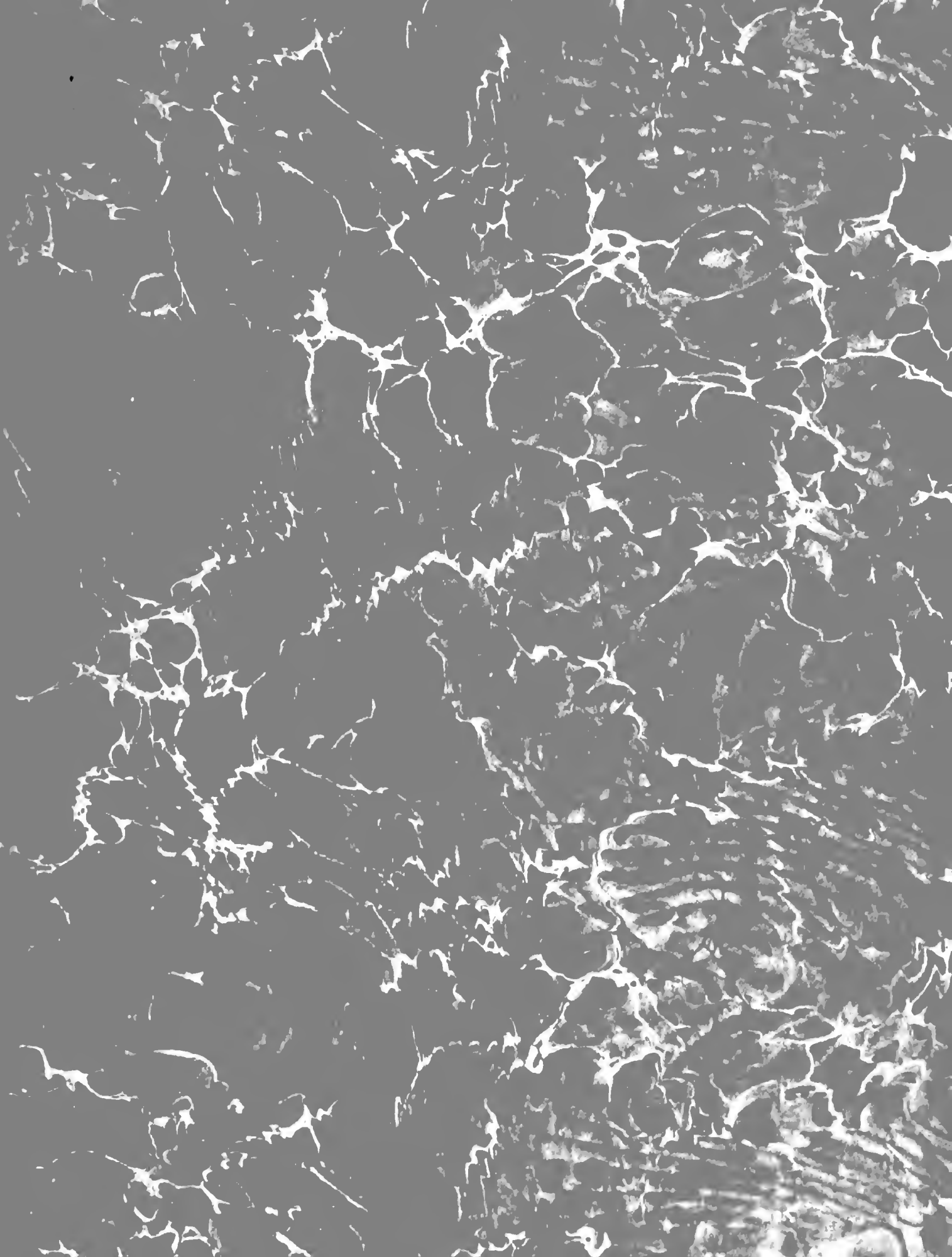


2^g



2^f





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